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> *"Modern communication technologies have the potential to bypass several stages and sequences in the process of development encountered in earlier decades"*
>
> ***National Policy on Education - Program of Action 1992***

DEPARTMENT OF EDUCATION
DELHI GOVERNMENT

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For further information contact:

Shri Ashok Kumar, Project Manager(CAL)
CAL Resource Centre, Patrachar Vidyalaya,
Lucknow Road, Timarpur, Delhi - 110054
Ph: 91-11-23819901, 91-11-65175605, 91-9810894959
Email : ashokkumarcal@gmail.com

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August 23, 2006

SHEILA DIKSHIT
CHIEF MINISTER
GOVT. OF NATIONAL CAPITAL TERRITORY OF DELHI

MESSAGE

I am glad to know that the Education Department of the Government of NCT of Delhi is introducing a complete set of animated learning and study material called – CALtoonZ. This is indeed a path-breaking effort on the part of the Department and crosses new frontiers in Computer Aided Learning in schools. I am sure that this will open up more opportunities for innovative learning and teaching practices in our schools. It is heartening to learn that CALtoonZ has been developed by a dedicated team of officers and teachers from schools under the Directorate of Education. The launch of CALtoonZ is a major step towards making learning a joyful and exciting experience in our schools, for both teachers and students.

I commend the efforts of the Department in this regard and would like to congratulate the CALtoonZ team in this great effort, and also wish them success in all their future endeavours.

Sheila Dikshit

(SHEILA DIKSHIT)

August 22, 2006

सत्यमेव जयते

ARVINDER SINGH LOVELY
MINISTER FOR EDUCATION
GOVT. OF NATIONAL CAPITAL TERRITORY OF DELHI

MESSAGE

The launch of CALtoonZ is indeed an extremely happy day for the Department of Education. I am deeply impressed by the technical excellence of the animations and it is no wonder that this initiative is so popular amongst both students and teachers. It is also very gratifying to learn that the pilot project was successful in increasing the retention levels in the transition phase from primary to upper primary, and in reducing the drop outs.

I am very proud to be part of this initiative. May it go from strength to strength.

(ARVINDER SINGH LOVELY)

August 23, 2006

R. NARAYANASWAMI
CHIEF SECRETARY
GOVT. OF NATIONAL CAPITAL TERRITORY OF DELHI

MESSAGE

I am immensely pleased to know that the Education Department is launching CALtoonZ, an initiative on joyful learning, which capitalizes on the power of animation and multimedia to impart interesting and meaningful education to the children of Delhi. CALtoonZ marks a paradigm shift towards integrating the education system with the rapid, technological changes taking place all around us and provides the disinterested and the discerning, a conducive atmosphere, to learn & excel. This is an extremely laudable effort, which needs to be nurtured and encouraged at every stage.

My best wishes to all those who have dedicated their time and energy for the project, and I wish them enormous success.

(R. NARAYANASWAMI)

August 22, 2006

RINA RAY
SECRETARY (EDUCATION)
GOVT. OF NATIONAL CAPITAL TERRITORY OF DELHI

INTRODUCTION

Some years ago I heard a phrase that intrigued me very much. "Joyful Learning" seemed to me at that time to be every child's dream come true and I feel privileged today to be in a position to realize, in some way, this dream of visionaries such as Prof. Yashpal. In order to bring about the enormous change required, the Department of Education, Government of Delhi has launched a flagship programme called YUVA in 2005 with the aim of ensuring joyful, interesting and meaningful education for all children, learning that attracts children to schools, helps to retain them and increases academic levels. YUVA is firm that the educational system exists for the child (and not vice-versa) and insists on placing the child at the very centre of all efforts. A number of very innovative steps have been initiated under YUVA;

1. Realizing the connection between high drop out rates, particularly in Standard VI, and repeated failures in the end of year exams, a conscious decision was taken to permit a one time re-examination for all students who would otherwise have to repeat a class. This exam was held in June this year and was optional. It was preceded by comprehensive remedial classes for the students. The Department initially felt that this move might be unpopular but we were amazed at the response. Both children and their parents wholeheartedly welcomed this opportunity and we had many requests from students of aided and private schools to extend it there. One activist group even went so far as to say that it would file a PIL if we did not make this re-exam mandatory in all Delhi Schools. Needless to say that this step really helped to increase the retention and reduce drop out rates.

2. A very strong campaign for mainstreaming out of

school children was undertaken through out the metropolis. Leading NGOs, officers and enlightened members of society came forward and worked tirelessly in every corner of Delhi to bring large numbers of children into schools.

3. A detailed analysis of the results in the Standard X and XII CBSE exams was conducted. Based on the findings, a comprehensive package of child friendly interventions was implemented as a consequence of which students of the Department's schools recorded the highest ever results. We are proud of the fact that this was achieved without putting any pressure on the children to study.

4. A School Adolescence Education Programme (SAEP) was launched to introduce life skills to all students, as defined by the WHO. This fascinating programme covers the entire range of issues facing the adolescence from puberty to pimples, fair skin to nutrition, and early marriage to academic issues. It tackles sensitive areas also such as HIV/AIDS, smoking, substance abuse, molestation and female foeticide. 38,000 teachers, Head of schools and officers have undergone a one of a kind training on this SAEP which ranged from attending classes on Yoga and meditation to watching films like Munnabhai, MBBS to learn the power of appreciation and a warm hug, to sessions by the very courageous Smt. Neelam Katara on meeting life's challenges.

5. Under Project Raksha around 6 lakh girls in Government schools through out Delhi are being trained in the techniques of self defence in collaboration with Delhi Police. This fascinating project is not only enabling girls to stand tall and protect themselves but is also building in them the courage and confidence to take their own decisions and to say a firm "NO" wherever required. I have no doubt that this is going to have an enormous impact one day when all these girls become women and they start asserting themselves and say "NO", be it to unsafe sex without a condom (with a partner who may have HIV) or the murder of her unborn baby daughter (female foeticide).

6. Other than Yoga as a subject, modules on yoga, meditation and laughter therapy have been introduced in all schools. This has not only made both teachers and students more calm but has really livened the atmosphere in otherwise mostly very serious, Government schools.

7. Other initiatives under **YUVA** include a strong focus on every child participating in sports and games, quizzes, language development and reading pursuits, cultural activities and very interesting programmes such as Culture Quest which is being run in partnership with the State University of New York. Special emphasis is placed on the teacher as the pivot of the system and an invaluable agent of charge, and in fact YUVA is as much for the teacher as the student. New awards have been introduced for teachers who display excellence in any area be it mainstreaming out of school children or helping differently abled students. Our Principals will also be starting training at the IIM Ahmedabad this year.

As a consequence of these steps there has been an enormous change not only in schools but in the attitude of the officers, teachers and students. Everyone is upbeat and very enthusiastic about the future. This "feel good" factor can of course be demonstrated through comments and photographs and also personal observations, but there are three major areas where these initiatives have borne very impressive results in terms of measurable indicators namely:-

1. Performance levels : While the results in Standard XII have gone up by a respectable 2% from 76% in 2005 to 78% this year, the Standard X results have increased by a dizzying 12% from 48% in 2005 to 60% in 2006. This is the highest increase in the CBSE ever and is equal to the cumulative improvement over the last 6 years for Delhi Government schools. It is all the more commendable because it was achieved with 12% more students appearing in the exam compared to last year.

2. Enrolment: As against 10,10,103 students in August 2005, there are 11,37,569 students in the schools of the Delhi Government only, as on August 2006. This indicates an increase of more than 1.27 lakh children, equivalent to a rise of 12.62% in one year alone.

3. Drop out rates: There has been a significant reduction in the levels of children dropping out of school and this in fact has gone down from 19.7% in 2004 to 5.9% this year.

It is abundantly clear that the initiatives under YUVA are yielding very positive results. It would be entirely correct to say that more than one lakh children who would otherwise have dropped out at various classes or remained out of school, have now been retained in the school system or have been mainstreamed in the schools of the Department of Education. We still have a long way to go and we have to bring all children to school, eliminate dropouts and ensure continuous, high quality learning. But it would appear that with YUVA we have a package of interventions which, if they are implemented for the next few years, will see Delhi reach the goals enunciated in the National Policies and the Millennium Development goals.

One of the most important and fascinating initiatives under YUVA is the Computer Aided Learning (CAL) programme which is being launched in September, 2006 in a brand new, refined and exciting version called CALtoonZ 2006. That children, and indeed even adults, love cartoons is well-known and this technology has been successfully used in many countries to teach students in a classroom. Such attempts do exist in India also but CALtoonZ has some unique features which make it, well, unique!

1. Each and every CALtoonZ has been conceptualised and developed by the teachers of the Directorate of Education, working with multi- media professionals in our own centre. The involvement of 'Ma'am' and 'Sir' has brought in the much needed customization of the material ensuring that it is tailor made to the requirements of the students of schools in Delhi. The CALtoonZ have been designed keeping in mind the strengths and weaknesses of our students.
2. Because it is an in-house venture CALtoonZ is not static and permanent but dynamic. It is not a package which, once delivered to a school, cannot be changed, but an utterly flexible initiative which responds to changing situations. For example, as we go to press, scientists have taken a momentous decision that Pluto is no longer the ninth

planet of the solar system but is a 'dwarf planet'. Our solar system now has eight planets. The admirable fact about CALtoonZ is that a new film incorporating this change can be made in the space of a week and delivered to all schools. Care will of course be taken to see that all aspects of this development are communicated so that there is no mismatch with the educational system.

The involvement of teachers and the leading role played by them in CALtoonZ has been an empowering activity for them, one which has broadened the horizons of their knowledge and capabilities immeasurably. It has also ensured very strong feelings of ownership. Other than parents no one can feel more elated than a teacher when her students do well. Teachers are motivated to invest in developing CALtoonZ because they know of its immense benefits to their students.

CALtoonZ has been built on the strongest of foundations -- a pilot project in 200 schools of the Department of Education spanning almost a year and an intensive review workshop by experts. The learning experiences from these two crucial projects has enriched CALtoonZ, ironed out its edges, endorsed and commended most of its methodologies, and has created a fascinating, exciting world for students that is truly remarkable.

For perhaps the first time in the country CALtoonZ prescribes the pedagogy for computer aided learning in schools in India.

It has demonstrated that it can increase retention in schools and lower the drop out rates. While all Delhi Government schools have registered significant improvements this year the degree of such improvements has been more in the 200 schools covered by CAL compared to the other schools without CAL. CAL was an integral component of the remedial classes conducted in these 200 schools.

The course context for Standard X as per the CBSE syllabus is ready, and work on preparing the materials for all remaining classes has started. In addition to this, the SAEP will also be converted into CALtoonZ films and this will be a real boon in the teaching of sensitive subject where teachers are still hesitant. To accommodate all this a second CALtoonZ Centre is being operationalised at DIET Pitampura with support from the Ernst & Young Foundation who have been with us from the beginning. In a path breaking initiative, senior school students will learn the techniques of making animation, and will collaborate to prepare the SAEP material. They will thus not only participate actively in the design and development of their own curriculum but will also be Peer Educators in the true sense.

CALtoonZ has not only made our schools a happier place but has had a very positive impact on official work also. Everyone enjoys working for this enchanting programme and we all have our favourite character be it Tuskless the elephant, Achchu the pencil, or Helmet. The sheer power of CALtoonZ is something we witness every day and thanks to the songs, even officers happily rattle off the functions of blood (from "Main Hoon Rakt Ki Boond Ek") and the factors determining poverty (from the 'news channel' module) with effortless ease. If adults are enjoying CALtoonZ so much it is no wonder that the children are almost giddy with delight. We invite you to share this remarkable world with us so that children all over the country can learn with joy.

August 22, 2006

VIJAY KUMAR
DIRECTOR (EDUCATION)
GOVT. OF NATIONAL CAPITAL TERRITORY OF DELHI

PREFACE

Exactly a year ago, on September 5, 2005, the Directorate of Education launched the pilot of its new initiative in Computer Aided Learning (CAL) in 200 schools of the Delhi Government. The Pilot was a Bridge Course for Class VI students, to consolidate basic concepts of Classes I to V, so that studies in Class VI and above could be built on a firm foundation.

The goal of the pilot was to examine whether Computer Aided Learning could liven up classrooms and bring joy to learning, could engage students and increase performance levels, and in doing both reduce drop-outs.

I am delighted to report that students, teachers and Principals have enthusiastically taken to CAL, that enrolments are on the rise in CAL schools, that many more children have been promoted from Class VI to Class VII, and, most important, that the drop-out rate has fallen. We believe this is but the beginning. We are so encouraged by the results that we have decided to extend CAL across our system, to all schools and all classes. This year we are launching CALtoonZ for Classes I to XII and we feel sure that we are well on our way to ensuring that all our students and teachers will go joyfully to school, will taste success and so develop a love of learning.

This book is intended as a document of a journey – from taking up as a challenge the mandate of national policies to use IT and ICT for effective teaching-learning – through conceptualization, implementation and evaluation of the Pilot. It is the document of the attempt of a committed team of teachers and software experts to realize their vision of a joyful and productive classroom. Finally, the book attempts to abstract a framework of universal design from the experiences and learnings in our context, as a broad reference for others starting out on the same journey.

I look forward to continued improvement and expansion of CALtoonZ, and increased learning in our classrooms.

ACKNOWLEDGEMENTS

The Department of Education wishes to acknowledge the support provided by the MHRD under SSA and the SCERT which has made the initiative possible, and the Ernst & Young Foundation for their support for the pilot and their continuing cooperation throughout the project.

We are indebted to the very distinguished members of the review Task Force headed by Prof. V.K. Tripathi and members Prof. Ajit Mohanty, Prof. Dharam Prakash, Prof. K.G. Rastogi, Prof. Poonam Batra, Prof. I. Zaidi, Prof. Vasu, Dr. Usha Bhatnagar, Dr. Pawan Sudhir, Dr. Jay Narain Kaushik, Dr. Arvind Mishra, Dr. Rajesh Kumar Arya, Shri S.S. Rastogi, Ms. Harsh Kumari, Shri Ashok Gogia, Shri Vijay Kumar, Smt. Lilly Bhardwaj, and Smt. Leena Jain.

CALtoonZ and this document would not have been possible without the guidance, encouragement and support of Smt. Rina Ray, Secretary Education, Shri Vijay Kumar, Director Education, Dr. V Candavelou, Addl. Director of Education, and also Smt. Gita Sagar, former Secretary Education, Shri Rajendra Kumar, former Director Education and Smt. Gitanjali Kundra, former Additional Director Education.

We also thank the editing team of Dr. Sveta Davé Chakravarty and Ms. Sujatha Balachander.

Above all a very big thanks to the CALtoonZ Team headed by Shri Ashok Kumar and members Shri B.P.S. Kardam, Smt. Vijay Mohan, Smt. Nita Behl, Smt. Neelma Puri, Smt. Vandana Sharma, Shri. Rajendra Kumar, Shri. Ashwani Kumar, Shri. N.S. Dahiya, Shri. Sudhir Kumar Mudgal, Dr. Rakesh Singh, Shri. Sanjay Prakash Sharma, Shri. Arbind Kumar Pandey, Shri N. Bhaskara Rao, Ms. Pallavi , Ms. Priyanka and the Technical Team headed by Shri Vikas Kumar and Shri. Sunil Kumar.

XECUTIVE SUMMARY

NTRODUCTION

the context of the national mandate to provide quality education to every child by suring universal access, equity, universal retention and achievement, the Department of ucation of the NCT of Delhi has launched a flagship programme – YUVA – integrating olescent education and joyful learning into the curriculum across the state school tems. The benefits of using computer technology to assist learning, especially of children m disadvantaged backgrounds, have only recently come to the centre-stage. With a new nputer Aided Learning (CAL) initiative, the Department of Education is seeking to fulfill imperative of providing education that can engage the interest of every child, so that ntion and learning can be ensured.

CAL

puter Aided Learning is an integrative technology which describes an educational ironment where a computer program

- is used to ***assist*** the user in learning a particular subject
- refers to an overall integrative approach of instructional methods and is actually part of the bigger picture
- comes about after re-assessment of the current teaching methods
- treats the computer as an ***aid*** to an overall learning strategy with other methods such as worksheets, lectures, text-books etc.

L is very different from Computer Based Learning (CBL) which primarily

- ***replaces*** the more traditional methods of instruction, in particular the lecture
- solves the 'staff to student' ratio crisis
- provides no coherent instructional strategy within which CAL would form a part
- makes success dependent upon the student's self discipline and motivation.

Why CAL

With the understanding that the current methods of teaching were not adequate to help students learn, the Department of Education decided that Computer Aided Learning could be used to complement regular teaching. The clear presentation of concepts on the computer would be used by the teacher to clarify the students' understanding and the programme would provide the teacher with a database of graded exercises to use in the classroom to consolidate and monitor student learning. An additional benefit would be that the teacher's own concepts would get clarified further.

VISION

To increase student achievement and retention through Computer Aided Learning

PILOT PHASE

Research in the Delhi Government schools had shown that a large percentage of children in Classes VI to XII are not clear about the basic concepts which they should have learnt by the end of Class V. This has a negative impact on their ability to learn in higher classes.

Class VI Bridge Course

In the pilot phase it was decided to address the very high failure and dropout rates at Class VI level, by introducing a multi-media Bridge Course in all subjects to be delivered in the first three months of Class VI, to bridge gaps in content and skills.

Multimedia Content Development

Multimedia content covering the syllabus of Classes I to V was developed with the involvement of primary stakeholders. To ensure contextual relevance, the Department's own teachers developed the entire content. Students were involved in the pre-launch testing of the product.

Partnership for Implementation

Recognizing the project's potential for large-scale impact, the Ernst & Young Foundation offered to support the Pilot Phase by providing state of the art hardware to equip CAL classrooms in 200 schools. This support to the Department at a critical juncture enabled the implementation of the very ambitious Pilot Phase.

Setting up CAL Classrooms in 200 Schools

CAL Classrooms were set up in 200 schools with

- One Computer CPU with UPS
- One 29" Television Monitor.
- Computer Cabinet
- Colourful Chairs

ection of Schools

nce CAL was to be introduced in only 200 schools out of 930, it was essential that a diverse of schools be chosen for the pilot, so that the project could be tested under various uations, and the impact on student learning be gauged in various contexts. The 40 top ools, 40 middle-level schools and the 120 poorest schools were selected.

ining for Implementation

of Trainers (TOT): A 2 day module was delivered to the CAL Resource Group nprising 27 teachers and technical persons at the CAL Resource Centre, Timarpur.

of Teachers: Approximately 1100 teachers received training for 10 days each, in operation of computers, and for 3 days on the module generated during the TOT cribed above, for the handling of multimedia content.

of Heads of Schools: This was imparted to explain the purpose and cesses of the CAL project being piloted in their schools.

Development: The Academic Support Group of the Department of Education) developed a timetable to accommodate the CAL Bridge Course in the pilot schools. the timetable developed would have to be applicable to schools with between 2 and 22 ions of Class VI, with only 1 CAL classroom per school, 5 different timetables were eloped.

and Mentoring: A support system was developed with the CAL Resource Team ailable for on-site follow-up and mentoring to teachers, with a module for online feedback from teachers to the CAL Resource Centre. District and zonal officials visited CAL classrooms on a monthly basis and submitted their report online in a prescribed format.

STATE-LEVEL LAUNCH BY THE CHIEF MINISTER

In a grand function at the Talkatora Stadium on September 5, 2005, the CAL project w formally launched by the Hon'ble Chief Minister of Delhi, Smt. Shiela Dikshit. The Hon'b Minister for Education, Shri Arvinder Singh Lovely, the Secretary Education, Smt. Ri Ray, and the Director Education, Shri Vijay Kumar addressed the gathering.

IMPLEMENTATION

The multimedia Bridge Course was delivered from September 2005 onwards to students Class VI in 200 schools.

OUTCOMES OF THE PILOT

What the Empirical Data show

The drop-out rate between Class VI and Class VII, which was very high, and the primar motivation for the CAL Pilot, has been directly impacted by the introduction of CAL i classrooms.

Findings:

1. There has been a marked decrease this year in the dropout rates in all schools of the Delhi Government. However, the extent of decrease is steeper in schools with CAL at 7.51% compared to schools without CAL at 5.74%.
2. While there is a marked increase in enrolment in 2006 in the Delhi Government schools as a whole, the increase in CAL schools, at 13.97% is greater than the increase of 11.93% in non-CAL schools.
3. This is all the more significant as in 2005 it was the non-CAL schools that showed the greater increase (5.57% against 4.42%) in enrolment.

Observations:

- It is clear that CAL is an effective methodology for reducing dropout rates.
- CAL schools appear to attract more students than non-CAL schools after the introduction of CAL technology.
- CAL has undoubtedly made learning joyful.

reliminary Benefits

e introduction of CAL has brought about what appears to be a revolutionary change in Teaching - Learning process in the schools where it has been implemented.

e benefits observed include time saved in the classroom in presentation of information, nessing of best practices, reduction of absenteeism and truancy, an inbuilt substitution tem for absentee teachers, increased learning effectiveness, concept clarity for teachers, literacy, involvement of multiple intelligences, increased possibilities for review and petition, teacher as a facilitator, and uniform quality of presentation of information.

st importantly, children hurry to get to the CAL classroom to get a good seat, there is itement in the air in CAL schools and children appear to be learning more and retaining re.

e the entire development of the software is an in-house endeavour, the capacity of the Resource Team and the entire IT Department has increased exponentially and a ture of teamwork has developed.

VIEW OF MULTIMEDIA CONTENT

-day workshop was held at the CAL Resource Centre, Timarpur, in May 2006 for the ltimedia content to be reviewed and ratified by eminent scholars and stakeholders who re associated with the field of Education, and to obtain their comments/suggestions for further improvement.

Purpose of Review

1. To critically examine the work already done for accuracy, adequacy, appropriate pedagogy, audio-visual integrity, equity, diversity, secularity and equality.
2. To prepare guidelines for future productions keeping in view all the points given above.

THE WAY FORWARD

The characteristic of the CAL Pilot of the Department of Education, Delhi, that sets it apart from available multi-media packages is that it is truly need-based:

i. it has been created by the system's own teachers
ii. it has been tested in the context of the system's own schools and success has been proved by empirical data
iii. it is based on the current syllabus

Immediate Next Steps

Based on the outcomes and learnings of the CAL Pilot, the Department of Education is taking CAL forward across the school system. Given that the requirement of clear, interesting and concise content delivery extends to all classes, the entire curriculum from Class I to Class XII will be converted into interactive multimedia based content, so that the Teaching-Learning process becomes more joyful, easy and interesting, and students are attracted to the classroom.

The School Adolescence Education Programme(SAEP) of YUVA shall also be converted into CAL. This will be a unique opportunity to prepare high quality and standard material on sensitive subjects which teachers may be hesitant to teach e.g. HIV/AIDS.

In a remarkable initiative, senior students of the DoE schools shall learn about the basics of CAL and prepare the CAL material on the SAEP. To accommodate all these new thrust areas, a second CAL Resource centre is being opened at the DIET Pitampura.

The CAL content for Class X based on the CBSE syllabus and the NCERT curriculum is now ready.

These initiatives have led to a fresh, new CAL which incorporates the learnings from the Pilot and the recommendations of the Review, which has been named CALtoonZ and which shall be formally launched by the Hon'ble Chief Minister of Delhi on September 4, 2006.

Emerging Framework for replicating CAL

In order to facilitate replication, a framework has been developed providing guidelines for planning for effective implementation, setting up a CAL Resource Centre and CAL lassrooms, and developing a system of support and monitoring. Guidelines have also been eveloped for multi-media content development.

DAGOGY OF CAL

mputer Aided Learning implies a pedagogy or science of teaching that is different from traditional classroom. This technology harnesses four specific advantages to enhance quality of learning possible in the classroom:

Quality information

n environment in which access to information of all kinds is severely limited both for hers and for students, computer-aided instruction provides the opportunity to ensure accurate and comprehensive information is provided on every concept. Further, in an onment in which teachers may lack motivation, concept clarity, or instructional skills, technology makes it possible to standardize the information provided in every sroom.

r Engagement

widely acknowledged fact that in Government school systems the environment is conducive to learning. Students do not enjoy going to class and are reluctant to rtake the tasks generally assigned by teachers. CAL technology is especially ortant for such environments since it enables learner engagement. Increased learner agement resulting from increased interest in instruction inevitably translates into improved student performance.

onse Time

The computer software is developed to provide optimal response time longer when a concept is new or especially difficult and increasingly short when the content is understood and the level of challenge needs to be increased. Research has proven that shortened response time heightens learner engagement and increases learning.

Individualized Learning

Computer Aided Learning also provides the opportunity to students to practice on their own with the computer or to have access to the information for revision or repetition of the concepts taught in class.

The Role of the Teacher in a CAL Classroom

The teacher changes from being "a sage on the stage to a guide by the side". The teacher's role is to direct students to specific learning outcomes by assessing where each student is in terms of knowledge of a topic and to decide how much needs to be taught and at what level. Th teacher continuously monitors the understanding of the learners, provides explanations to fill gaps, decides what level of exercises to provide and manages movement to the next difficulty level.

Partnership with Civil Society: Guiding Principles

- The focus should be to play to each other's strengths. The ability of a corporate partner to remain involved for the entire cycle of implementation, monitoring and evaluation ensures that the rigour that is a corporate strength becomes integral to the whole project.
- A successful partnership entails focus on both equity, which is a critical concern of the government sector, and high quality, which is a core value in the corporate sector.
- For institutionalization of any initiative, it is critical that the relevant Department takes ownership of the whole initiative, with all its systems, processes, equipment and materials, rather than letting the external partner take the lead.
- Open lines of communication for dialogue to resolve concerns are the key to a successful partnership.

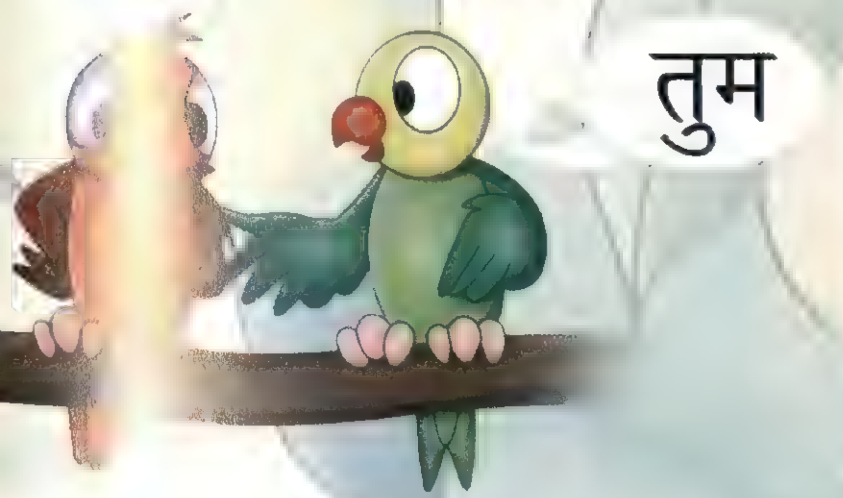
PRINCIPLES FOR INSTITUTIONALISATION

Some principles for institutionalisation have also been derived from the experience with the CAL Pilot.

- Involvement of key stakeholders – Department officials, District officials, Heads of Schools, teachers, students and parents – in identifying the need, developing the vision and planning for implementation is important to ensure (i) that decisions taken are informed by ground-reality and (ii) that those who have to implement the project own it.
- Support from the leadership at all levels – State, District, Zone, School – and systems for proper planning for implementation and monitoring are critical for institutionalization of the initiative. Willingness to take risks is a critical requirement for innovative projects in public systems.
- Taking an initiative to scale and ensuring institutionalization requires meticulous planning and monitoring. Regular review of feedback from different levels ensures that, on the one hand, glitches do not stall the process and create disillusionment on the ground, and, on the other, it leads to ongoing improvement.

CAL toonz
Department of Education
Delhi Government
Sub: Hindi (SCERT)
Class:
Chapter: Sarvnaam

Selected clips from CAL toonz film



आपने इनकी बात सुनी ये सब अपने नाम की जगह कोई और शब्द प्रयोग कर रहें हैं जैसे - मैं, तुम और वह। ये सारे शब्द सर्वनाम ही तो हैं।

SECTION I

THE CONTEXT OF NATIONAL POLICIES ON EDUCATION

Constitution of India Article 21 A - Right to Education

> *"The State shall provide free and compulsory education to all children of the age of six to fourteen years in such manner as the State may, by law, determine."*

National Policy on Education Programme of Action 1992

> *"Modern communication technologies have the potential to bypass several stages and sequences in the process of development encountered in earlier decades"*

[illegible] Prospects, UNESCO 1999)

> *"A longitudinal study of a statewide experiment with computers in the classroom found that those most in need of help – low-income, low-achieving students, and students with disabilities – made the most gains."*

In the last 20 years there has been an emphasis on the national imperative to provide Education for All. Nation-wide programmes such as the District Primary Education Programme (DPEP), and the current Sarva Shiksha Abhiyan seek to ensure universalization of elementary education of satisfactory quality with emphasis on "education for life". National leaders are increasingly focussing on the critical need to provide life-oriented relevant education to every citizen so that India continues to grow as a global player.

From the Hon'ble President's address to the Joint Session of Parliament, Feb 25 2005:

> *"Ours has been a knowledge-based civilization for millennia and yet we remain a country with an unacceptably high rate of illiteracy.*
>
> *My Government will give priority to issues of both access and excellence in education."*

From the Prime Minister's Speech delivered at the First Meeting of the Governing Council of the National Mission for Sarva Shiksha Abhiyan on February 21, 2005:

> *Education for every child "is not just an item in our political manifesto. ....We give dates that have lost meaning. We need Education for All today, here and now.*
>
> *I want the sense of urgency to inform this programme. This has to be a truly national campaign ...In every village and mohalla, the 'Sarva Shiksha Abhiyan' Mission must ensure participation of all children in the age group of 6-14 and ensure their continuation upto Class VIII and make the schools function well. The drop out rate in schools is unacceptably high."*

Hon'ble Prime Minister of India in his auspicious speech from the Red Fort on Independence Day, 2005:

> *We need to make education joyful, interesting and meaningful so that children develop a desire to go to school.*
>
> *We need to pay particular attention to the education of first generation learners.*

NATIONAL POLICY ON EDUCATION (NPE) 1986 & PROGRAMME OF ACTION(POA) 1992

The NPE 1986 and the POA 1992 stress the need for Educational Technology to extend the reach of education to distant frontiers.

Media and Educational Technology

8.10 Modern communication technologies have the potential to bypass several stages and sequences in the process of development encountered in earlier decades. Both the constraints of time and distance at once become manageable. In order to avoid structural dualism, modern educational technology must reach out to the most distant areas and the most deprived sections of beneficiaries simultaneously with the areas of comparative affluence and ready availability.

8.11 Educational technology will be employed in the spread of useful information, the training and re-training of teachers, to improve quality, sharpen awareness of art and culture, inculcate abiding values, etc., both in the formal and non-formal sectors. Maximum use will be made of the available infrastructure. In villages without electricity, batteries or solar packs will be used to run the programme.

8.12 The generation of relevant and culturally compatible educational programmes will form an important component of educational technology, and all available resources in the country will be utilized for this purpose.

8.13 The media have a profound influence on the minds of children as well as adults; some of them tend to encourage consumerism, violence, etc., and have a deleterious effect. Radio and T.V. Programmes, which clearly militate against proper educational objectives, will be prevented. Steps will be taken to discourage such trends in films and other media also. An active movement will be started to promote the production of children's films of high quality and usefulness.

LEARNING WITHOUT BURDEN: REPORT OF THE NATIONAL ADVISORY COMMITTEE (YASHPAL COMMITTEE RECOMMENDATIONS) - 1992

1. The Problem of Curriculum Load

Our Committee was concerned with one major flaw of our system of education. This flaw can be identified briefly by saying that "a lot is taught, but little is learnt or understood". The problem manifests itself in a variety of ways. The most common and striking manifestation is the size of the school bag that children can be seen carrying from home to school and back to home everyday. A survey conducted in Delhi revealed that the weight of the school bag, on an average, in primary classes in public schools is more than 4 kg while it is around 1 kg in MCD schools. Nevertheless the load we want to discuss is not only the physical load but the load of learning which is there for all children irrespective of the category or type of schools where they study. Eminent writer R. K. Narayan had drawn the country's attention to this daily sight by making a moving speech in the Rajya Sabha a few years ago. The situation has become worse over these years, with even pre-school children carrying a bag of books and notebooks. And the sight is not confined to metropolitan cities alone; it can be seen in small towns and the bigger villages too. The weight of the school bag represents one dimension of the problem; another dimension can be seen in the child's daily routine. Right from early childhood, many children specially those belonging to middle classes, are made to slog through home work, tuitions and coaching classes of different kinds. Leisure has become a highly scarce commodity in the child's, especially the urban child's life. The child's innate nature and capacities have no opportunity to find expression in a daily routine which permits no time to play, to enjoy simple pleasures, and to explore the world.

2. Joyless Learning

It is hard to reconcile the rigorous 'academic' regime that is imposed on children from an early age with the widespread complaint made about the declining norms and performance of the formal system of education. Teachers routinely complain that they do not have enough time to explain anything in detail, or to organize activities in the classroom. 'Covering' the syllabus seems to have become an end in itself, unrelated to the philosophical and social aims of education. The manner in which the syllabus is 'covered' in the average classroom is by means of reading the prescribed textbook aloud, with occasional noting of salient points on the blackboard.

YASHPAL COMMITTEE RECOMMENDATIONS – Cont....

2(a) The process of curriculum-framing and preparation of textbooks must be decentralized so as to increase teachers' involvement in these tasks. Decentralization should mean greater autonomy, within state-level apparatus, to district-level boards or other relevant authority, and to heads of schools and classroom teachers to develop curricular materials on their own, best suited to the needs of local environment. All the schools be encouraged to innovate in all aspects of curriculum, including choice of textbooks and other materials.

9. Greater use of the electronic media be made for the creation of child-centered social ethos in the country. A regular television programme addressed to students, teachers and parents and possibly called 'Shiksha Darshan' be launched, along the lines of the 'Krishi Darshan' programme. [*Emphasis added*]

REPORT OF THE GROUP TO EXAMINE THEFEASIBILITY OF IMPLEMENTING THE RECOMMENDATIONS OF THE NATIONAL ADVISORY (YASHPAL) COMMITTEE: CHATURVEDI COMMITTEE REPORT - 1993

2. (a) The writing of textbooks as far as possible, should be assigned to school teachers and to those who have developed professional expertise in the area. Subject-matter specialists should be engaged as consultants or advisers to vet the content and presentation of the subject–matter to ensure its accuracy.

.......*.......*.......

9. Greater use of electronic media for education is an essential part of modernizing the educational system. A regular programme on TV addressed to students, teachers and parents would be very welcome. The Group took note of the fact that the Ministry of Human Resource Development, Department of Education, has already made a request for allocating one channel for education out of 15 or 16 channels which have recently become available with the commissioning of INSAT 2-A. The Group strongly suggests that an educational channel should be operationalised at the earliest and this channel should include a programme of the nature suggested by the Yashpal Committee. [*Emphasis added*]

5.5.3 The Use of Technology

The judicious use of technology can increase the reach of educational programmes, facilitate management of the system, as well as help address specific learning needs and requirements. For instance, mass media can be used to support teacher training, facilitate classroom learning, and be used for advocacy. Possibilities of teaching and learning at varied paces, self-learning, dual modes of study, etc. could all benefit from the use of technology, particularly Information Communication Technology ICT. The increasing use of the internet has enabled the sharing of information and provided space for debate and dialogue on diverse issues hitherto unavailable on such a scale. Technological innovations are also necessary for appropriate equipment and aids for meeting the learning requirements of children with special needs. What needs to be underscored is that technology could be integrated with the larger goals and processes of educational programmes rather than viewed in isolation or as an add-on. In this context, technological use that turns teachers and children into mere consumers and technology operators needs to be reviewed and discouraged. Interaction and intimacy are key to quality education, and this cannot be compromised as a principle in any curricular intervention.

The significance of Educational Technology (ET) as a site for curriculum planning has been widely recognised, but detailed guidelines and strategies for its educationally optimum use have not yet been worked out. Generally, technology has been used as a medium to disseminate information, and as a way of addressing the scarcity of good teachers—usually the consequence of poor recruitment policies. ET, which is used to redress the problem of quality of teaching, can only exacerbate the disillusionment of teachers with teaching. If ET is to become a means of enhancing curricular reform, it must treat the majority of teachers and children not merely as consumers but also as active producers. There must be widespread consultation regarding use during development and implementation. ET facilities need to be used at all levels of schools —cluster and block resource centres, district, state and national level institutions — in order to provide hands-on experience in using ET. Such experiences provided to children, teachers and teacher educators, could include something as simple as the audio-recording of an interview with a village elder, to making a video film or a video game. Providing children more direct access to multimedia equipment and Information Communication Technology (ICT), and allowing them to mix and make their own productions and to present their own experiences, could provide them with new opportunities to explore their own creative imagination.

NATIONAL CURRICULUM FRAMEWORK 2005 (Cont.)

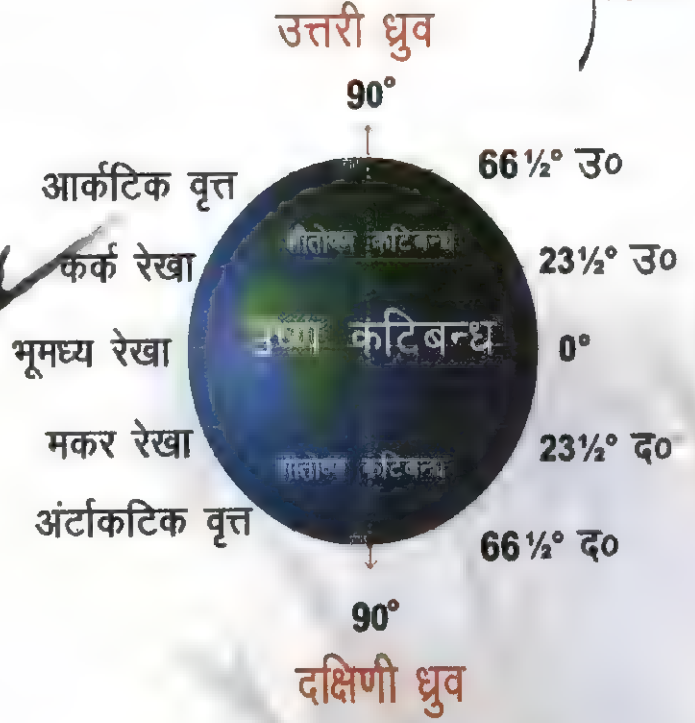
Such an experience of ET production, rather than only watching and listening to programmes in a passive way, can lay the foundation for far better utilisation of the country's enormous ET facilities. Interactive Net - enabled computers, rather than only CD-based computer usage, would facilitate a meaningful integration of computers and enhance the school curriculum in rural and remote areas by increasing connectivity and enhancing access to ideas and information. It is such two-way interactivity rather than one-way reception that would make technology educational.

Rather than trying to reproduce and mimic classroom situations, or teaching the textbook content, or animating lab experiments, ET could realise far better potential if topics are taken up but developed into non-didactic explorations, leaving learners free to relate to the knowledge web progressively, and learn at their own levels of interest. Such access to knowledge in regional languages is still very limited, and is one of the main reasons for the persistent and growing divide between learners from urban and rural schools, and learners from regional - language and English - medium schools. The potential of such encyclopedias and documentaries for children is still underdeveloped. Materials such as textbooks, workbooks and handbooks for teachers can be designed with the awareness of existing stocks of good-quality audio or video material and sites where extra resources are available on the Net. Classics of cinema need to be made accessible through such measures. For instance, a child studying about village life should have easy access to Satyajit Ray's classic, Pather Panchali, either as a CD to be borrowed from the CRC or to be viewed on a nationally managed website. Future textbooks need to be conceptualised and designed in ways that might integrate knowledge in different subjects and experiences, thus facilitating the assimilation of knowledge. For instance, a middle school textbook that discusses the history of Rajasthan and mentions Meera should be able to offer the text of a bhajan composed by her, and also refer to a source where that bhajan has been archived, so that children can listen to M.S. Subbulakshmi singing it. Integration of knowledge and experience along these lines would take away the sense of burden and boredom that our present-day education induces. In science and mathematics, and in teaching children with disabilities, the potential of ET, including IT, is widely appreciated. It is important to realise this potential in achieving curricular goals, with more age-specific planning on the use of ET. Governments and other agencies responsible for financial planning need to take this fuller range of ET's demands and benefits. [*Emphasis added*]

The Yashpal Committee was emphatic about the need to promote JOYFUL LEARNING. The Report reiterates the importance of teacher involvement in curriculum development, a tenet that has been adhered to in the CALtoonZ project.

The National Curriculum Framework recommends that technology should be integrated with curricular goals. The decision of the Department of Education to bring in computer-aided learning (CAL) rather than computer-based learning (CBL) reflects this mandate. Further, in keeping with the recommendation that teachers and children become active producers of curriculum, the CALtoonZ project has been developed entirely by teachers with feedback from children taken to improve the product. In the very near future, the curriculum for YUVA-SAEP will be developed by the children themselves.

In summary, the need to make learning attractive to children rather than a burden to be endured or escaped from, has been the refrain of the many Reports following the NPE 1986 and the Yashpal Committee recommendations some years later. The understanding that Information Technology (IT) and Information and Communication Technology (ICT) can serve the aims of education by making education more child-centered, "relevant and culturally compatible," has increased in the last decade. However, the benefits of using computer technology to assist learning, especially of disadvantaged children, have only recently been brought centre-stage. With its CALtoonZ initiative the Department of Education in the NCT of Delhi is seeking to fulfill the imperative of providing education that can engage every child so that effective learning can be ensured.


उत्तरी ध्रुव
90°
66 ½° उ०
आर्कटिक वृत्त
शीतोष्ण कटिबन्ध
कर्क रेखा
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उष्ण कटिबन्ध
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मकर रेखा
23½° द०
शीतोष्ण कटिबन्ध
अंटार्कटिक वृत्त
66 ½° द०
90°
दक्षिणी ध्रुव

पृथ्वी को ताप की मात्रा के हिसाब से तीन मुख्य क्षेत्रों में बाँटा गया है। उष्ण, शीतोष्ण और शीत कटिबन्ध

SECTION II

THE CAL PILOT

CHAPTER 1: Rationale

The Department of Education has been engaged in identifying for both Elementary and Secondary education the factors that are responsible for high drop-out rates and low achievement levels in the government schools in Delhi which serve the majority of first-generation learners in the metropolis. The NCT of Delhi has a unique demographic profile. As the capital of India and a metropolitan city, Delhi attracts a large number of people from different parts of the country in search of employment, livelihood and education. As the continuous migration from other places far outpaces the natural growth in the population of Delhi, it puts tremendous pressure on the existing infrastructural facilities on the one hand, and on the other makes the provision of services extremely difficult.

The Department of Education is committed, however, to not only ensuring that every child is in school but also seeing to it that the education provided in the schools under the Delhi Government is joyful, meaningful and interesting. Before taking CALtoonZ to scale and introducing it in all schools for the benefit of all students, it was necessary to carry out a Pilot to check the efficacy of Computer Aided Learning.

Elementary and Secondary education in Delhi consists of 4 school systems, three under the Municipal Local Bodies namely the New Delhi Municipal Committee (NDMC), the Municipal Corporation of Delhi (MCD), and the Delhi Cantonment Board (DCB), and one, the Department of Education (DoE), under the State Government of the NCT of Delhi. This multiplicity of agencies greatly complicates the coordination of primary, upper primary and secondary education and makes the diagnosis of need, and planning of coherent reform of basic education, very difficult. Primary Education in the NCT of Delhi is the responsibility of the Municipal Bodies while Secondary and Senior Secondary Education are the responsibility of the State Government. As a result, children join Delhi Government Schools in Class VI after passing out of Class V from municipal schools and also from recognized and unrecognized private schools. While the Delhi Government does run 363 Sarvodaya Schools which are from Class I to XII, the number of children in primary classes is not high.

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Situational Analysis

At the primary level, children are automatically promoted to the next class on the basis of their attendance, i.e. promotion is not on the basis of any examination. In the absence of an effective and child friendly system to assess achievement levels, teachers and students have little idea of the learning gaps. The majority of students in Class VI were not able to clear the end-of-term annual exams. This disturbing fact, along with the observation of teachers and heads of schools that incoming Class VI children from the formal systems (municipal schools and recognized private schools) and from unrecognized private school were under-prepared, marked the beginning of research to identify the problem.

A study conducted[1] in Central District government schools to assess incoming Class VI student competencies in Hindi and Maths, with a sample size of 1872 students of 20 schools revealed the following:

Findings of the Study

In both Language and Maths

- Approximately 33% of the students have Class III competencies
- 33% have some knowledge of basic concepts
- 33% have no knowledge of basic concepts
- Prevalent language pedagogy fragments language and takes away even basic comprehension and sentence construction skills
- Prevalent maths pedagogy focuses on memorization of procedures and does not provide conceptual clarity

The study showed that incoming Class VI students have at best Class III level competencies in language and maths, with one-third of the students at Class I or II level and one-third not even at Class I level. Further, the study showed that teachers at Class VI level often have poor subject knowledge, poor teaching skills and lack an understanding of the profile of first-generation learners[2]. This combination creates a disempowering environment both for teachers and for students and contributes to increased failure and drop-out levels in Classes VI to VIII.

Moreover, the Delhi District Information System for Education (DISE) 2003 data reveals that the ratio of transition from Primary School to Upper Primary Schools is high but while errolment increases greatly in Class VI, there is a much greater fall in Class VII, suggesting that retention of children coming into Class VI must be given urgent attention.

Study of Class VI Achievement Levels, 2001, Central District School Reform Programme (SRP) in partnership with the Centre fot Education Management and Development(CEMD)

Pre-test of Teachers in Teacher Training Workshop, SRP Foundation Course, Central District, 2003

As indicated earlier, it is important to understand the profile of students, particularly those in Class VI. While many do come from middle class and relatively better off backgrounds, the situation of most children can be characterized by the following:

- A large segment are from backgrounds of extreme disadvantage, living perhaps in one room tenements or even on the streets. There is little or no scope for study at home.
- Economic deprivation prevents children from acquiring teaching-learning materials.
- A majority of the children are first generation learners whose parents cannot help them in their studies.
- Many work in order to eke out a living and simply don't have the time and energy to study at home.
- While these do have an impact on low achievement levels, other very significant factors include a dull curriculum, as pointed out in various documents such as the Yashpal Committee Report, and indifferent teaching.

> The Department of Education became increasingly aware that there was a critical need for the education provided by the system to be joyful, interesting and complete in order to improve the life chances of students in the system.

The Need in Class VI

VI Bridge Course

To address the very high failure and dropout rates at Class VI level, it was decided to introduce a Bridge Course in all subjects to be delivered at least in the first three months of Class VI, to bridge gaps in content and skills.

equisites for the bridge course

a) It should cover the entire syllabus of Classes I to V.

b) In order to ensure that all children get equal opportunities to learn, the course should not require any homework or practice at home or any parental guidance. All teaching - learning should be done in the classroom itself.

c) This means that only a fraction of the time spent in routine teaching should be spent on teaching methodology, and the time thus saved should be utilized in exercises and practice. An exhaustive set of practice exercises should be readily available to the entire class which can be completed in the school in the time available.

d) In order to bridge 5 years' of learning into a few months, it is important to choose a methodology that is more effective than the traditional instructional practice in primary school.

CAL met all these requirements, and thus the Pilot was born[1].

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[1] See Section III: Outcomes of the Pilot

CHAPTER 2

The Pilot Bridge Course using Computer Aided Learning (CAL

Objective of the Pilot

To develop and deliver in 200 schools a bridge course using CAL for the children joining Class-VI of Delhi Government Schools, (i) to consolidate basic concepts of Classes I to V in the key five subjects, in order to provide a solid foundation to build on and (ii) to ensure that basic concepts become clear to all teachers in the system.

What is CAL?

Computer Aided Learning(CAL) is commonly confused with Computer Based Learning (CBL), and Interactive Technology.

However, CAL is very different from CBL, as illustrated below:

CAL	CBL
Computer Aided Learning describes an educational environment where a computer program ▪ is used to **assist** the user in learning a particular subject ▪ refers to an overall integrative approach of instructional methods and is actually part of the bigger picture ▪ comes about after re-assessment of the current teaching methods ▪ treats the computer as an **aid** to an overall learning strategy with other methods also such as worksheets, lecture, text-book	Computer Based Learning is a computer program ▪ which replaces the more traditional methods of instruction, in particular the lecture ▪ provides no coherent instructional strategy within which CAL would form a part ▪ solves the staff to student ratio crisis ▪ makes success dependent upon student self discipline and motivation

Why CAL?

It was necessary to consider the following questions, so that the identified initiative could provide the solutions:

- Why are children not learning enough in school?
- Why do children drop out from school?
- Why are children prone to absenteeism?
- Why is there widespread disinterest in studies?
- Why do children dislike textbooks?
- Why is school so boring for children?
- Why is it that children love cartoons and even manage to retain and rattle off the tongue-twisting foreign names, actions and dialogues of every cartoon character, and yet the same children struggle incessantly with essentially Indian names in history?

With the understanding that the current methods of teaching were not adequate to help students learn, the question that arose was to identify subjects and within subjects, the specific areas (learning objectives) in which traditional methods were failing. Could these objectives be taught solely through a computer-based programme? If not, in what way could a computer program help? What other methods need to be used together with CAL?

Extensive deliberations brought clarity and the Department of Education decided that CAL could be used to complement regular teaching. The clear presentation of concepts on the computer would be used by the teacher to clarify the students' understanding and the programme would provide the teacher with a database of graded exercises to use in the classroom to consolidate and monitor learning. It was expected that the teacher's own concepts would also be clarified.

What the Research Says.....

1. Effectiveness of ICT

The effectiveness of ICTs the realization of their potential depends to a large extent on the context and quality of application. Moreover, since ICTs are only tools for education, it is difficult to indicate the factors that may be contribution to a positive result such as educational philosophy, quality of teaching, parent support, and students' characteristics.

With these caveats, evidence from large studies and meta-analyses suggests that use of ICTs, particularly computer technologies, is correlated to positive academic outcomes, including higher test scores, better attitudes toward schools, and better understanding of abstract concepts.

A longitudinal study of a statewide experiment with computers in the classroom found that those most in need of help-low-income, low-achieving students, and students with disabilities-made the most gains.

In addition to better performance in traditional measures of academic achievement, a secondary benefit of ICTs in education is to familiarize new generations with the technologies that have become integral components of the modern world. However, research on the effect of ICTs on academic achievement continues to be open to criticism (as with all other areas of education). Critics deny positive findings as the result of flawed studies, while supporters promote positive results without sufficiently evaluating the quality of the studies.

In the final analysis, ICTs are as good as they are used. The path from potential to effectiveness is neither easy nor automated. [*Emphasis added*]

Mann, D., Shakeshaft, C., Becker, J., Et. Kottkamp,R.(1999): *West Virginia Story: Achievement Gains from a Statewide Comprehensive Instructional Technology Program.* Milken Exchange on Education Summary

2. Teacher support and empowerment.

- A survey of more than 2000 teachers and school principals across the United Sates, the teachers stated that the technology helped them to become more effective (92% of respondents) and creative (88%).
- Both teachers and administrators agreed that technology had reinforced instruction, and functioned as a motivator for the students, who were more prone to ask questions and participate in the lessons.

Corporation for Public Broadcasting(1997): *Study of School Uses of Television and Video, 1996-97 School Year. Summary Report. ERIC document # 413879.*

VISION

To increase student achievement and retention through Computer Aided Learning

THE PHILOSOPHY

There are basically three philosophies at work in the introduction of Computer Aided Learning:

1. The power of animation and multimedia.
2. The engagement of the system's own teachers
3. The time-effectiveness of the medium

1. The Power of Animation & Multimedia

Multimedia can

- Animate the static
- Simulate the hazardous or costly experiment
- Capture reality
- Add movement to static concepts
- Add dimension to abstract concepts
- Add an element of fun in sometimes boring situations
- Include audio/video clips of the original person/events such as the "Tryst with Destiny" speech of Pandit Jawahar Lal Nehru.

By providing many kinds of stimuli, multimedia programmes address multiple intelligences and hence reach every child in the classroom.

Further, the human brain stores information as images in visio-spatial sketch pads to be used later in mental reconstruction of objects no longer present to our senses, the mental construction of unknown objects and decoding unfamiliar symbols into known representations, which is helpful in language acquisition. Multimedia programmes which provide visual representation thus facilitate construction of meaning by the learner.

What the Research Says.....

3. Rationale for Multimedia Use

Why would any instructor want to use multimedia materials in the classroom? To a certain extent, psychology instructors have adopted these new types of media simply "because they could." As each improvement in technology became available (in many cases with the support of textbook publishers), instructors who saw themselves as "hip, cool, and hi-tech" quickly incorporated the new tools, correctly perceiving that slick multimedia presentations have a certain amount of entertainment value for students. However, this rationale misses the point; in fact, the use of multimedia materials has substantial grounding in cognitive theory and research although, as is often the case, the research evidence followed the widespread use of these materials rather than preceded it.

Several dozen studies indicate that computer-based multimedia can improve learning and retention of material presented during a class session or individual study period, as compared to "traditional" lectures or study materials that do not use multimedia (see Bagui, 1998; Fletcher, 2003; Kozma, 2001; Mayer, 2001). According to Najjar (1996), this improvement can be attributed mainly to dual coding of the information presented in two different modalitiesvisual plus auditory, for example (Clark & Paivio, 1991; Paivio, 1986) leading to increased comprehension of the material during the class session, and improved retention of the material at later testing times (Mayer & Moreno, 1998). There is general agreement that multimedia presentations are most effective when the different types of media support one another rather than when superfluous sounds or images are presented for entertainment value which may induce disorientation and cognitive overload that could interfere with learning rather than enhance learning (Mayer, Heiser, & Lonn, 2001).

Finally, a number of studies have suggested that student satisfaction and motivation is higher in courses that use multimedia materials (Astleitner & Wiesner, 2004; Yarbrough, 2001). In one particularly large study, Shuell and Farber (2001) examined the attitudes of over 700 college students toward the use of computer technology in twenty courses representing a wide range of academic disciplines. Students were generally very positive about the use of technology, although females rated the use of technology for learning and classroom instruction somewhat lower than did their male peers. However, not everyone is excited about the new technology. On the basis of negative anecdotes described on student evaluations and in discussions at professional conferences, we can conclude that some students and some instructors have had bad experiences with multimedia in the classroom. It is important to keep in mind that a poorly developed and/or executed use of multimedia can do more harm than good (Daniel, in press).

In our opinion, these negative experiences often seem related to lack of experience with computer technology, instructors allowing the program to direct the flow of the course, or to overly optimistic expectations about the media (or to underpowered projectors that necessitate dimming the room lights). Our own classroom experiences, combined with the research evidence, lead us to summarize the potential pedagogical value and rationale for using classroom media in these three points:

- *To raise interest level* -- students appreciate (and often expect) a variety of media
- *To enhance understanding* -- rich media materials boost student comprehension of complex topics, especially dynamic processes that unfold over time
- *To increase memorability* -- rich media materials lead to better encoding and easier retrieval

Ludwig, Thomas E., Hope College; Mathie, Virginia A.,James Madison University: Using Multimedia In Classroom Presentations: Best Principles, Society for the Teaching of Psychology, Pedagogical Innovations Task Force

The System's Own Teacher is the Best

Teachers who have taught children for years have the greatest understanding of their needs, psychology and requirements, even though they might not always be subject experts. Hence it is important that the Department's own teachers take a lead role in developing the nstructional content.

Time Saved is Time Gained

ost children studying in government schools come from poor backgrounds, with no time or ace at home to supplement class work. As first generation learners, they do not get much arental support. Besides, many of them have to support their families economically by ing sundry jobs. The classroom is the only viable place for them to learn. But the intended stribution of time in the prescribed curriculum for various classes assumes that some arning has to take place in the children's home in the form of self study, revision and homework.

ven the limited instruction time in the typical school year, it is critical to save time on livering input and to free time for student engagement to process information. The ultimedia lesson takes a fraction of the time that is taken by the traditional chalk and alk method in explanation of a concept. If a concept needs 35 minutes to explain by the traditional method, it takes approximately 5-10 minutes by multimedia and that too with more effectiveness, since multiple senses are engaged. This 25-30 minutes saved can be utilized in revision and practicing, thereby obviating the need for self study, revision and homework.

What the Research Says.....

Research on the use of graphics and animation in learning
Adapted from the Eberly Center for Teaching Excellence at Carnegie Mellon University

The following is a summary of research conducted on the use and design of animations as instructional tools. The research pertains to stand-alone tutorials or demonstrations, although some of the points would also hold for in-class demonstrations.

Types of processes or objects that benefit most from the use of animations:
Animations are best suited for information that is procedural in nature, has a certain degree of complexity, and is difficult to observe in the real world.
In particular, animations are useful for processes that:

- take place over very long periods of time such as continental drift, embryological development, etc.
- take place too quickly in real time, such as engine cycles, neuronal conduction, etc.
- are microscopic (or invisible), such as a cell membrane, viral infection, etc.
- are macroscopic, such as astronomical motion
- have many complex sub-processes, such as photosynthesis
- require concrete visual representations of qualities, such as speed, density, or temperature

Principles of Animation Design
Multiple forms of instructional materials (e.g., text, audio, visuals, etc) will facilitate learning only if they help the learner to:

- form representational connections between the verbal material and verbal mental representations,
- form representational connections between the visual material and the visual mental representations, and
- form referential connections between verbal and visual representations.

Thus instructional materials must help students map the verbal and visual material onto mental representations and support the integration of these representations into one coherent representation:

In general, animations that have violated these principles have shown either no or even negative effects on student outcomes.

- The design must focus and guide the attention of the user to the relevant information.
- Narration must occur simultaneously with the relevant animation.
- Misconceptions can lead to misinterpretations and misperceptions of the relevant information.
- Color and/or sound for its own sake may not have any impact or possibly a negative one if it suggests importance or differences among objects that don't exist.
- Text within the animation should be used sparingly.
- Use the appropriate level of abstraction.
- Use of metaphor: Familiar processes or objects that share properties with the instructional materials can be useful for learners, especially learners with lower-knowledge.
- Create user controls
- Clearly mark the end of the animation.
- The type of assessment or desired learning outcome is important to consider.

Multimedia Content Development

Goal

[illegible]

The Process

Benchmarking prior to the Initiative

Educational CDs and other materials developed by leading companies including Microsoft, IBM, BBC, DK and others were studied. It was observed that they largely cater to the upmarket clientele i.e. public schools, whereas the CAL project needed to be conceptualized keeping in mind that the students are from the poorer sections of society and that the content needed to keep in view their background and the general context of government schools.

Guiding Principles

- In keeping with the recommendations of the Chaturvedi Committee, it was decided that the CAL content would be developed in-house by the system's own teachers, people who have a deep understanding of the context;
- The content to be developed would be an integral part of the curriculum rather than an add-on;
- The teacher and the students would be active participants in the CAL classroom, determining content to be viewed and exercises and group-work to be undertaken.
- Content development would be research-based to ensure quality.

Sequence of Multimedia Content Development

Technical Arena

Defining the Learning Objective

The syllabus of the relevant class was broken up into Units, and these units then divided into graded learning objectives by a group of subject-teachers.

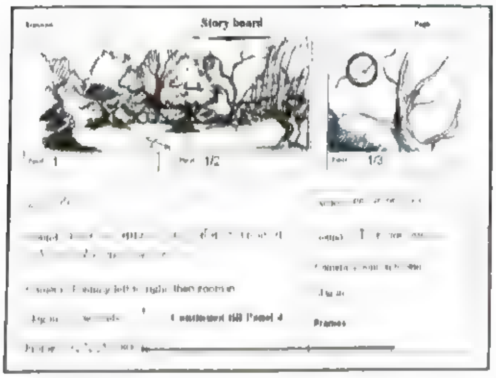
Gathering information

Scriptwriting

- Relevant interesting information was gathered from the available reference material, encyclopedias, journals, Internet etc. For example, if the names of months of the calendar year were to be taught, information on its evolution from the ancient Roman calendar having 10 months to the present form would be sourced: January is named after the Roman God 'Janus', July after 'Julius Caesar', August after 'Augustus Caesar', September to December because of the prefixes 'Septa, Octa, Nona, Deca' being the seventh, eighth, ninth and tenth months respectively of the original ancient Roman calendar.
- Once the content was finalized it was categorized.

Storyboarding: Preparation of Information for Presentation

A story was then woven around the final categorized content. A story board was prepared complete with models of experiments, dialogues, narrations, jingles, intended type of background music etc.



Story Board

Development of Characters

Paper to Computer

Creating the Background

Preparation of Material for Guided and Independent Practice

Database of Questions: An exhaustive set of questions of all types was prepared, and graded for complexity with every topic looked at from different angles and at several levels so that if all the questions are done in a sequence, a topic will become crystal clear. Thus, around ten thousand questions were developed for the curriculum from Classes 1 to 5.

Games: Some questions were also used to develop computer games to be played by students to consolidate and/or assess learning.

Art-work and Animation

- The artists and multimedia programmers then developed characters based on the story. This was an intense process whereby 13 to 30 drawings were made for one second of animation.
- The drawings were scanned, digitised and coloured.
- Paintings or other images were made for the background with characters to move in the foreground.
- This was followed by animation of the story.

Voice Over

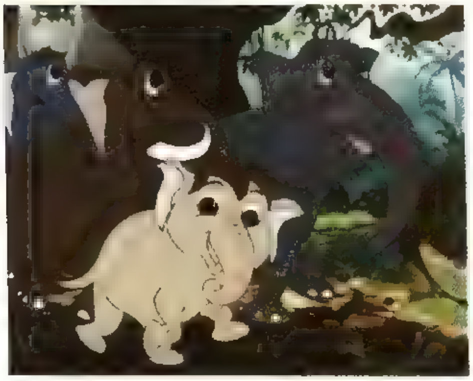
लम्बे करके नाखून दाँतों से चबाना गंदी बात .....
गंदी बात ...... गंदी बात ...... गंदी बात.....

जुएँ वाले बालों में डालें हाथ–खुजाना गंदी बात
गंदी बात ...... गंदी बात ...... गंदी बात.....

मक्खियों से है भरी खोम्चे वालों की गंदी चीजें
खाकर उन को पड़ जाना बीमार बहुत ही गंदी बात
गंदी बात ...... गंदी बात ...... गंदी बात.....

लालाजी की तरफ केले खाकर फेंक देना छिलके
उन पर गिर कर कोई अपनी टाँग तुड़ाए गंदी बात
गंदी बात ...... गंदी बात ...... गंदी बात.....

दातून कुल्ला किए बिना ही खाना खाना गंदी बात
धूल भरी गलियों में नंगे पाँव दौड़ना गंदी बात
देख देख कर औरों को चीजें जी ललचाना गंदी बात
गंदी बात ...... गंदी बात ...... गंदी बात.....



Final Output

[illegible]

The voiceover and recording of the dialogues, narration, jingles and other accompanying music were completed in the sound studio in the CAL Resource Centre.

[illegible]

The sound and video were amalgamated and interactive animation based multimedia content produced.

[illegible]

Review by Target Audience

- The finished content was reviewed by a larger group of teachers and improvements solicited.
- After incorporating the suggestions, the content was shown to a group of children and their comprehension of the subject assessed from their responses. In cases where the response from the children was not very encouraging, the entire story board was revised to make it more comprehensible and interesting.

CHAPTER 3

mplementation

Launch

grand function at the Talkatora Stadium on September 5, 2005, the CAL project was ched by the Hon'ble Chief Minister of Delhi, Smt. Sheila Dikshit. The Hon'ble Minister for ation, Shri Arvinder Singh Lovely, the Secretary Education, Smt. Rina Ray, and the tor Education, Shri Vijay Kumar addressed the gathering. The Ernst & Young dation team, all Deputy Directors of Education, Education Officers and Heads of Schools tudent teams from several schools participated. The CAL Resource Team of teachers who ped the content were honoured by the CM. It was an important day for the CAL team, lmination of many months of hard work on the Pilot, and the excitement was almost ble. The audience clapped enthusiastically, and the students roared their approval of the ated clippings!

DIRECTORATE OF EDUCATION G.N.C.T.

Partnership for Implementation

Recognizing the project's potential for large-scale impact, the Ernst & Young Foundation (EY offered to support the Pilot Phase by providing state of the art hardware to equip CA Classrooms in 200 schools through an MoU signed on July 29, 2005. While the investment b EYF was in itself a significant contribution, it is the involvement of the EYF team in a tru partnership in all phases of the Pilot, from sourcing equipment, troubleshooting installatio supporting sound overlay, monitoring systems, etc. that characterizes this truly revolutiona model of public-private partnership. This support to the Department at a critical junctur enabled the successful implementation of the very ambitious Pilot phase.

"The Ernst & Young Foundation has been privileged to be associated with the Department of Education (DoE) on this Pilot project. EYF entered into the MoU after witnessing the commitment of the leadership within the Delhi Govt. Education Department and the enthusiasm of the CAL team.

EYF appreciates the transparency of the Government in permitting it to directly procure all the assets that were required for the Pilot rather than to seek grant funds and to then utilize the funds by the DoE for purchases. This provided EYF comfort, as we could ensure that the funds allocated for this social initiative were in fact spent fruitfully in the project itself.

EYF was aware that there would be hurdles/breaks on the way as with any new initiative, but none that would distort the broader vision of helping the children learn through an innovative method of teaching. The school visits have helped confirm EYF's expectations on this Pilot project.

The cooperation extended at the time of implementation at most schools was very good and encouraging. Many Heads of Schools were proactive and went out of their way to make the implementation smooth.

Overall it has been a very wonderful experience for EYF to partner with the DoE in this unique venture. The issues documented here should be viewed more as a learning to ensure smoother implementations in the future rather than as highlighting constraints / impediments." *Ernst & Young Foundation*

Setting up of CAL Classrooms in 200 Schools

AL Classrooms essentially had to contain the following equipment, fixtures and furniture:-

- One Computer CPU with UPS
- One 29" Television monitor
- Computer cabinet
- Colourful chairs

e most important decision was where to put the TV monitor. The following points had to be ept in mind:

- The monitor should be visible from all corners of the room without causing any stress to children's eyes or neck
- Children sitting in the front row should not block the vision of the children in the back rows
- A child should not be able to reach the monitor
- The teacher should have easy access to the CPU as well as the blackboard at the same time
- Electrical fittings should be safe for children

ook many trials to fix the location and the height of the TV monitor at around 7 feet on one ner of the wall on which the blackboard was mounted. The mounting had to be diagonal in r to allow better visibility to all children. The seating arrangements were also diagonal, ay from the entrance door.

Schools

Since the CAL pilot was to be introduced in only 200 schools out of 930, it was critical that a diverse set of schools be chosen, so that the project could be tested in various situations and the impact on student learning gauged in various contexts. The selected CAL schools had to be a mixture of the best, medium, and poorest schools[4]. The final distribution was as under:

i) 40 of the best schools
ii) 40 medium schools
iii) 120 poorest schools

CAL Classrooms were equipped through the combined efforts of the Ernst & Young Foundation, and the CAL Resource Team of the Department. Given the tight schedule, this required smooth team-work, effective communication and quick problem-solving. The fact that the classrooms were ready within a month is testimony to the extraordinary teamwork of the Department of Education and the Ernst & Young Foundation.

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[4] Annexure 1: List of Pilot CAL schools

Reflective Summary

The following reflections on the process of setting up CAL classrooms were communicated to the Ernst & Young Foundation team:

- **Short School Hours:** One installation team would plan to cover at least 4 schools in each shift. At times, due to traffic, the installation team would reach the school a little after the school closing time and find that the school was closed. This would entail them visiting the school again the subsequent day, which resulted in some delays in installation initially. Learning from this, the team started calling the schools in advance informing them of their visit. Many schools proactively waited for the team even after school hours.
- **Storing the Goods:** Earlier the equipment was stored at the EY office from where it was sent to schools. This was slowing down the installation in schools in far flung areas. To manage the logistics, some TVs and Cabinets were stored in CAL classrooms in larger schools, and then distributed further to [illegible].
- **Converging Resources:** The approach road to some of the schools was so narrow that the truck carrying the chairs could not pass through. The matter was discussed with DoE officials and it was decided that the services of the vendor who distributed question answer papers for the DoE be used. Since the vendor had a good number of delivery vehicles (auto rickshaws), the decision also helped speed up deliveries.
- **Where do I sit?** During the discussion with DoE officials, it was agreed that 40 chairs would be delivered to each school. Many schools requested that extra chairs be provided.
- **Ownership of Equipment:** Safety of the equipment was a concern. This was discussed with the Director, Education who immediately issued a circular making the School Principal responsible for the equipment. This fixation of responsibility was also the reason why the CAL Classrooms could only be run in a single shift even in double shift schools.
- **Ensuring Children's Safety:** Grounding for the electrical connections was another concern. Keeping in mind the safety of the children, EY's project team which was overseeing the installation had been given clear instructions that no equipment would be installed in any school where the electrical connections were not properly grounded. This was slowing down the installation process. To sort out this issue, EY had its electrical engineers visit each school prior to installation to check the electrical wiring, give instructions to the School Principals to ensure that the electrical connections were properly grounded and if need be, have it done at EY's cost for those schools where it appeared that the Principals were facing problems in having this done at their exp

ET engineers were also instructed to carry spare switches/wires to ensure that they could fix minor problems on the spot, rather than wait for the school authorities to fix them, which would have delayed installations.

- **Creative Solutions:** There were [illegible] in some schools which had to be built [illegible] walls needed to be repaired to take the weight of the TVs, and windows had to be covered to ensure that the equipment was not damaged during rains.

Training & Implementation

Although the entire programme had been made extremely logical and easy to operate, the Heads of Schools and teachers who were to impart the multimedia lessons were trained thoroughly, both in the operation of computers and how to use the Computer Aided Learning material. After installation of the hardware and software, the teaching learning started.

Training of Trainers (TOT)

A 2-day Training of Trainers module to train 1000 teachers was developed and delivered for the CAL (Computer Aided Learning) Resource Group comprising of 27 teachers and technical persons on 17th-18th August 2005 at the CAL Resource Centre, Timarpur[5]. The objective of the training was to prepare the Resource Group to train 1000 teachers from 200 schools where the CAL pilot project for the class VI bridge course was to be implemented[6]. The module included basic facilitation concepts and group processes like grounding, roles of facilitator and recorder, principles of adult learning etc. The participants together developed the design for the 3-day teacher training to be imparted to the 1000 teachers.

The output of the training was a 3-day training module[7] complete with details on resources required for each session and the role of the facilitator for each session. Discussions during the training threw up the need to have a separate orientation session for the Heads of Schools of the 200 schools. Material generated during the TOT was compiled for teachers and heads of school[8].

Training of Teachers

Approximately 1100 teachers were trained for 10 days each in the operation of computers and for 3 days on the module generated during the TOT described above for the handling of multimedia content. Nodal CAL Classrooms were identified for the training, and resource teams consisting of one software operator and one curriculum expert conducted the trainings.

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[5] The Training of Trainers and the Orientation for Heads of Schools was conducted in partnership with the QSTAR Initiative of CEMD under Reach, India.

[6] Annexure 2: TOT Design

[7] Annexure 3: Teacher Training Module

[8] Annexure 4: Material for Teachers and Heads of Schools

Orientation of Heads of Schools [illegible]

Aug 29-Sep 1, 2005, Sarvodaya [illegible]

The objective of the orientation session was to help the Heads of Schools understand th purpose and processes of the CAL project being piloted in their schools; how CAL will aid building and consolidating basic concepts for students of Class VI using technology, thereb improving retention and quality. The session helped the Heads of Schools to think through th administrative, technological and academic issues that might come up during implementatio and the possible ways of dealing with them.

Timetable Development

The Academic Support Group of the Department worked to develop a timetable to accommodat the CAL Bridge Course in the pilot schools. Intensive deliberations yielded significan problems. For example, the timetable developed would have to be applicable to schools with between 2 to 22 sections of Class VI and only 1 CAL Classroom. 5 different timetables were eventually developed and shared with the CAL Resource Group as well as the Heads of Schools in their respective training sessions[9].

Support & Monitoring

Support

1. Follow-up by Resource Teams in Nodal CAL Classrooms: The Department of Education's team of IT Supervisors and the Resource Team visited the CAL Schools at least twice a month for the following:
    a. Support for hardware or software problems.
    b. Incremental training of the teachers.
    c. Provide newly developed/improved versions of the software.
2. Online Feedback: Heads of Schools provided feedback on-line to the CAL Resource Centre so that problems could be addressed, be it regarding hardware or software.
3. A permanent Mail ID in the name of 'CAL' was made operational on the internal MIS of the Department so that any teacher or student could give feedback about the CAL content which helped improve the programme.
4. A dedicated person was identified in the Department to coordinate issues between the

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[9] Annexure 5: 5 Timetables developed for 5 different kinds of schools

hardware, software and service providers.

- The District Deputy Directors, Education Officers and Deputy Education Officers visited all the CAL schools and submitted their observations regarding implementation of CAL, performance of children, opinion of Principal/Head of School in the prescribed format[10].
- Student performance was measured through a common exam given to all the students irrespective of whether they studied with CAL or not. This helped in ascertaining the effectiveness of the entire process.

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[10] Annexure 6: Government Order for Inspection; Inspection Format

Evolution of the CAL Resource Centre

A Resource Centre for multi-media content for teaching-learning is a multidisciplinary operation, requiring specialists from in diverse fields: teachers, script writers, fine artists, visualisers, clay modellers, multimedia programmers who specialize in character modeling, texturing, lighting and scripting, animators, singers, narrators, editors, drama artists of various ages, lyricists, music composers, studio technicians, and cameramen as well as administrative staff. An equally long list exists for the specialized equipment.
Besides, the whole exercise is very labour-intensive since for every second of production, 24 drawings have to be hand-drawn, scanned, digitized by hand, coloured, and then animated. If there is any jerk in the animation, the entire process has to be repeated once again. Normally, a professional animation film of 90 minutes takes a team of around 500 highly paid persons for two years. The State Department of Education obviously had none of the required professionals with the exception of teachers. Neither did the Department have any of the equipment that required. When, in a meeting called in the chamber of the Additional Director of Education, around 50 candidate-teachers were told that they would have to work after school hours for at least 5 hours a day, all except one left, one who till date continues to be one of our brightest resource persons.

Searching for committed teachers was the toughest job to start with. Then came the task of recruiting the right type of professionals i.e. fine artists, multimedia programmers etc. The Department took out an advertisement for recruiting multimedia programmers offering a salary of Rs.8,000 and Rs.10,000 per month on a contractual basis. At this salary nobody with experience came forward at the interview. The only 'professionals' who came were in the midst of their diploma courses or were jobless after completing their courses. For most of them it was their first job.

A lab meant for teaching functional computer literacy to children consisting of 20 computers was installed in the Patrachar Vidyalaya,Timarpur. The team started off in this building which had been lying unused for a few years and was devoid of any electrical fittings. This ragtag combination of infrastructure and manpower joined hands to develop multimedia content for the new millennium!!! Since nobody really knew anything about the task at hand, there was no hesitation or ego problem in learning from each other and doing extensive research on the Internet. After four months of rigorous effort, the team discovered that it had produced something that could be of use to learners. This boosted our morale, motivating us to work relentlessly in the following 2-3 months. Finally we were able to stand on our feet and produce something that could be shown to the outside world with some pride. That was the time when a scout team from Ernst & Young Foundation (EYF) introduced by CEMD, visited us to explore the possibility of working with the Government.

It is quite clear that the quality of content could not have impressed the EYF team. It must have been the sheer dedication and team spirit that won them over. They came like a godsend and offered all possible contributions from their side. Since we did not have any studio, they hired a top class studio for audio-recording at their expense. EYF also provided the basic set-up comprising of one computer and one 29" TV with furniture for 200 schools where they could be installed and run as a pilot. Since then EYF has become a permanent partner in the endeavour. CEMD came forward and lent a hand in the training of Master Trainers who in turn had to train 1100 teachers for 14 days starting from the basics like how to handle a mouse, how to use the computers etc.

> I loved participating in the production of the CAL project as I knew it would help the children of my country who are not that privileged as me and I had full hope and trust that this programme would be a huge success, because I spoke with my heart for all the children who are of the same age as me I felt very touched by the fact that even I could be a part of the project that would make a difference.....
>
> Pallavi Rajaram

Even today, the Department does not hire high-end professionals. The freshers who come here teach and learn from one another. In fact, a proper class is organized for an hour before and after working hours in which there is a new teacher everyday from the team itself. This tradition that has been maintained since the inception of the Resource Centre helps everyone to learn and grow collectively. As soon as one gets some experience she/he shifts to multinational companies on salaries that are three/four times what they are paid here and in fact everybody is encouraged to do that.

> It was a great experience to record my voice for the CAL project It was my first time recording. I had lots of fun speaking for the characters. I also felt nice recording because such little bit of recording could help in educating millions of children. I could even learn the 6th syllabus simultaneously as I am also in 6th....... .Priyanka

More than any technical competence or infrastructure, 'CALtoonZ 2006' is a product of collective learning and senior officers believing in the team and willing to allow it to fail. However, today the team comprises of all the categories of self-styled professionals mentioned in the first paragraph. We also have volunteers in good measure. There are a few child artists & narrators who immensely enjoy their recording. It has a decent lab equipped with a studio, where all audio recordings are made. It has 70 committed professionals—clearly focused on a shared vision—joyfully working long hours, seven days a week, and frequently into the night[11]. The team continues to innovate, to take risks and to grow as individuals and as a team.

ASHOK KUMAR
PROJECT MANAGER (CAL)
DEPT. OF EDUCATION
GOVT. OF DELHI

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[11] Annexure 7: CAL Resource Team

Selected clips from CAL toonz film

Department of Education
Delhi Government
Sub: Hindi (SCERT)
Class: VI
Chapter: Karak

[illegible]

[illegible]

SECTION III

OUTCOMES OF THE PILOT

PTER 1 WHAT THE EMPIRICAL DATA SHOW

lysis of Enrolment Data

nrolment data for the last three years was analysed for Classes VI and VII, to examine hether students of Class VI being promoted to Class VII. The data have revealed very ncouraging findings for CAL schools.

> Drop-out rate between Class VI and Class VII, which was very high (see Situational Analysis above), and the primary motivation for the CAL Pilot, has been directly impacted by the introduction of CAL in classrooms.

e enrolment of Class VI and VII in the schools of Department of Education for the last three ears is given below.

Class	2004		2005		2006	
	Non CAL	CAL	Non CAL	CAL	Non CAL	CAL
VI	175581	48016	185368	50142	207486	57147
VII	130942	33807	121378	30995	138789	36133

[illegible]

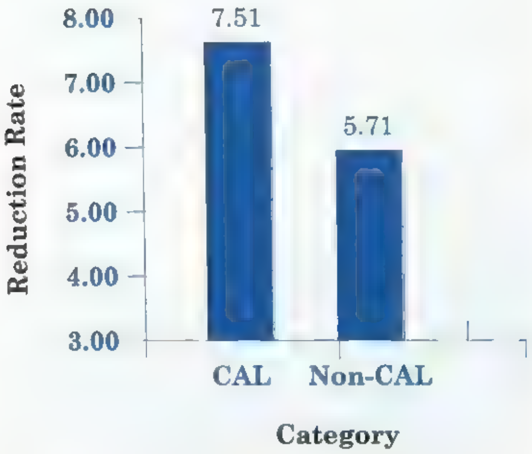
1. The Drop-out rate was arrived at by calculating the difference between enrolment in Class VII and enrolment in Class VI in the previous year, considered the base year, as a percentage of the base year's Class VI enrolment i.e.

$$\frac{\text{(Enrolment in Class-VI in the base year - Enrolment in Class-VII in the following year) * 100}}{\text{Enrolment in Class-VI in the base year}}$$

Reduction in dropout rate in CAL schools and Non-CAL Schools

	Dropout 2005(%)	Dropout 2006(%)	Reduction in dropout rate(%)
CAL	35.45	27.94	7.51
Non-CAL	30.87	25.13	5.74
Difference	4.58	2.81	

Reduction in Dropout Rate
in CAL and Non-CAL Schools 2006



Findings

There has been a marked decrease in the dropout rates in all the schools of the Delhi Government. However, the extent of the decrease is steeper in schools with CAL at 7.51% compared to schools without CAL at 5.74%.

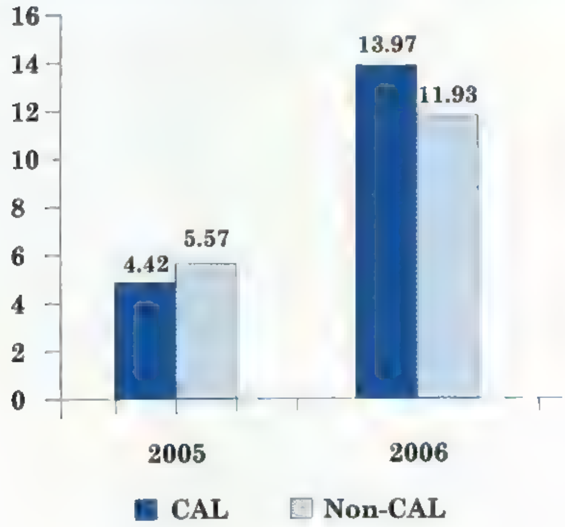
Further, the difference between the drop-out rates of CAL and non-CAL schools has reduced from 4.58 % in 2005 to 2.81% in 2006.

Observation: Despite the fact that the CAL Pilot was only launched in September '05 , it had an impact on dropout rate. It is clear that CAL is an effective methodology for reducing dropout rates.

Increase in Class VI Enrolment in CAL Schools and Non-CAL Schools

	Increase in 2005(%)	Increase in 2006(%)
CAL	4.42	13.97
Non-CAL	5.57	11.93

Increase in Class VI Enrolment in CAL Schools and Non-CAL Schools 2005



While there is a marked increase in enrolment in 2006 in the Delhi Government schools as a whole, the increase in CAL schools, at 13.97%, is greater than the increase of 11.93% in non-CAL schools.

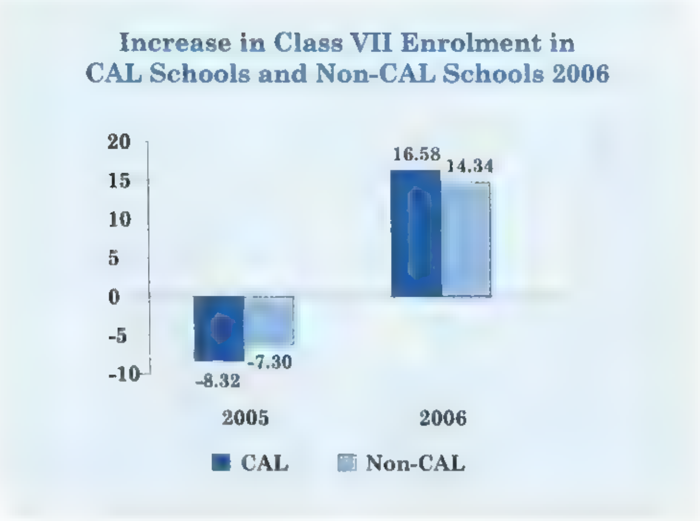
Further, in 2005 it was the non-CAL schools that showed the greater increase (5.57% against 4.42%). This may be attributed to the fact that in general the schools chosen for implementation of CAL were less attractive than the schools not provided with CAL. The introduction of CAL appears to have overcome other factors that discouraged enrolment and led to CAL schools overtaking the other schools that were perceived as "better" or more desirable.

Observation: CAL schools appear to attract more students than non-CAL schools after the introduction of CAL technology.

3. Increase in the erolment in Class VII was analysed for CAL and Non-CAL school

Increase in Class VII Enrolment in CAL Schools and Non-CAL Schools

	Increase in 2005	Increase in 2006
CAL	-8.32	16.58
Non-CAL	-7.30	14.34



Findings:

While enrolment has increased greatly in 2006 against a decrease in 2005, the increase in CAL schools is 2.24 greater than non-CAL schools.

Further, while the decrease was greater in CAL schools than in non-CAL schools 2005 at 8.32% as against 7.30%, the trend has been reversed in 2006.

[illegible]

The increased enrolment may be attributed both to reduction in drop-out rates (discussed in 1 above), and an increased percentage of students who completed Class VI successfully and/ or increased number of children joining class VII from outside the government school system.

It should be kept in mind that these impressive achievements across 200 CAL schools included 120 of the poorest schools in the entire Department of Education schools which have been considered 'unattractive' and where the results in Board exams is the lowest. The gains are therefore all the more admirable.

Chapter - 2 Observations and Learnings

कैल (CAL) भारतीय शिक्षा के इतिहास में शिक्षा का पहला माध्यम है जिसमें बच्चों की मनोवृत्तियों, सोच, जिज्ञासा लेत करके एक आकर्षण पाठ्यक्रय निर्मित किया है जिसमें शेक आकर्षण चर्मोत्कर्ष पर पहुँच गया है। खाली कक्षायें भरी खिडकियों से झाकते हैं, यही नहीं कैल (CAL) की कक्षा में घुसने की शिश करते हैं।

Dr. M.P. Yadav, Principal
GBSSS Mori Gate

I never understood how the earth can rotate on its own axis and also go round the t now when I saw it in my CAL class, ppy that I could see it actually and derstood how big the Solar System is.

Raju, Class 6 student
GBSSS, Mehrauli School

I like the 'Water' chapter in Science. The 'water drop' character explains everything very well. Our class sings along when songs come up. I also enjoy operating the computer when my turn comes.

Rukmani, Class Monitor
Class 6, Alipur School

The EYF Team went out to visit schools and came back with reasons to celebrate and some suggestions for improvement

Summary of findings:

- The ability of Class 6 children to recall much that had been taught, including dialogues, in a Model Town school (in a JJ cluster), was truly astounding. For us this clearly demonstrated the power of CAL, if implemented effectively.
- One teacher was of the view that just retaining the attention of all the students itself was a Herculean task in most government schools, especially in the economically backward areas. Her view was that CAL helped to ensure better discipline and the students were more attentive in the classroom due to the animated content, which enabled better teaching.
- Children in all the schools uniformly expressed their desire to learn more through CAL.
- Class 6 children of a school stated that they understood the Solar System better through this medium as they could see the planets moving around the Sun and also how the earth revolves in its own axis.
- Overall, consistently across all schools, the children seemed very excited about this new initiative, saying that they can now actually see what they are taught through text books.
- All the teachers with whom the monitoring team interacted with, uniformly stated that the children very enthusiastically look forward to the CAL period
- In a few schools, it was heartening to see that the children were handling the mouse in turns and setting the pace of learning.
- Separate CAL copies for different subjects are being maintained by most of the schools!!!

Children and teachers greatly appreciate the brightly furnished rooms.

PRELIMINARY BENEFITS OF CAL

The introduction of CALtoonZ has brought about wh appears to be a revolutionary change in the Teachin Learning Process in the schools where it has be implemented.

1. **Time Saved:** The multimedia lesson takes fraction of the time that is taken by the chalk a talk method in the explanation of a concep Reducing input delivery time has provide teachers with approximately 20 minutes p class period to help students engage with th concept through problem-solving, worksheets games etc., thereby obviating the need for sel study, revision and homework.
2. **Harnessing Best Practices:** In the classroom the use of innovative and interesting methodologies is limited to the extent of knowledge and understanding of a particular teacher. In CAL, collective wisdom accompanied by adequate research, review and testing is utilised. Further, the innovation of one person can be made available to all.
3. **Reduction of Absenteeism:** Since the content is very interesting, no child ever wishes to miss the multimedia class. It has been reported that children even miss their morning assembly in order to be in the multimedia classroom in a vantage position and not miss even a minute of the class.
4. **Reduction of Truancy:** Truancy appears to have reduced drastically.
5. **Substitution System for Absentee Teachers:** In case of the absence of a subject teacher due to any reason, another subject teacher or class monitor can effectively run the class.
6. **Learning Effectiveness:** A picture is worth a million words! No amount of verbal or graphical

After listening to the 'Gandi Baat' song, I throw banana peels only into the dustbin and I do not go bare foot in the road.

Rajesh, Class 6 student
Narela School

Now I am able to understand how far one place is from another as it is clearly explained in the CAL programme. We all wait for our CAL period and run to the CAL classroom.

Pinki, Class 6 student
Dhakka

It is learner friendly and a self explanatory programme. Students easily understand the concepts through the characters of CAL.

Vijay Kumar, Vice Principal
Govt. Sarvodaya Co-ed.S.S.S.
Anand Vihar, Delhi-92

explanation can do what a working three-dimensional model of a heart shown on a TV screen can achieve, whereby blood is seen clearly flowing through the chambers with accompanying sounds. Similarly, abstract concepts like Solar System, Solar and Lunar Eclipses etc. are very difficult to teach and are time consuming compared to three-dimensional interactive multimedia models of these.

7. **Concept Clarity for Teachers**: CAL bridges some of the limitations of teachers also. For example, the English pronunciation of most of teachers is lacking. But the multimedia content uses the standard pronunciation of an expert.

8. **IT Literacy:** This programme ensures IT literacy of both teachers and students.

9. **Flexibility**: The Teaching Learning material prepared in CAL programme is interactive. This means the speed and intensity of teaching can be adapted according to the needs, requirement and capabilities of the learning group.

10. **Involvement of Multiple Intelligences:** CAL involves multiple senses and multiple intelligences in the learning process. It increases the cognitive and motor abilities of the students as the teaching of every subject is complemented by various interesting games related to the content.

11. **Review Possibilities:** Any example or working model or pronunciation can be repeated assiduously any number of times according to the requirement of the students.

12. **Teacher as Facilitator:** Children being more computer IT savvy than the teachers, practical experience has been that children operate the content. The teacher now makes rounds of the classroom paying individual attention to the children something that s/he could not do earlier because most of the time was spent delivering lectures, writing on the board or showing experiments.

कैलक
म में आना हमें बहुत अच्छा लगता है, हमें यहाँ बहुत कुछ सीखने को मिलता है, इसमें जो कार्टून से पढ़ाते हैं उनको देखने के लिए हम सारा दिन इन्तजार करते हैं। इससे जो भी पढ़ते हैं याद हो जाता है, गाने भी याद रहते हैं।

VISHAL, VII A
GBSSS NO I, MORI GATE

CAL Programme is a very educative and enriching experience for e students to enhance learning. They and enjoy through this unique me which leaves an everlasting impression on their minds.

Vinita Shanker, Principal
SKV No.1, Shakti Nagar

Content developed by the CAL team is a very educative and enriching experience for the students to enhance learning

Urvashi Gupta, Vice Principal
Dr.Sampurnanand S.K.V.,
Yamuna Vihar

Site visit by EYF Team:

SKV, No 1 Shakti Nagar Mrs Vinita Shankar, Principal (Role Model to showcase how govt schools can be well run)

- Very well managed
- Class X students were so absorbed in taking notes that they refused to even turn and answer questions posed

GBSSS Model Town Bhoop Singh Verma, Principal (Role Model to showcase how CAL should be taught)

- Possibly the best model CAL class
- The school has understood how CAL should be taught. The teacher pauses the CAL lesson and immediately explains the concept again on a blackboard to reinforce the learnings
- The children's ability to recall all that was taught was truly astounding. This class demonstrated the power of CAL.
- Separate books were maintained by students for CAL notes / exercises
- Teacher suggested for more emphasis on written work in future

13. **Uniform Quality:** CAL also helps raise the quality of learning to a uniform high level, b compensating for teacher differences e.g.. schools face a teacher shortage or if all teacher are not equally motivated.

14. **New Mascots:** The initial attempt to u familiar characters such as a cat and mouse ha proven unnecessary. Achhu, the Pencil, a Helmet, created by the CAL Team have proved t be enormously popular with children.

Learnings

- ➢ Syllabus for Class VI must be provided in CA content as soon as possible.
- ➢ Timetables have to be developed by th individual school based on refined guidelin provided by the Academic Support Group.
- ➢ More written work is required to consolidat concepts.
- ➢ A blackboard or white-board is essential fo teachers to supplement teaching through CAL.
- ➢ More emphasis therefore should be laid on written work, especially in critical subjects like English and Maths.
- ➢ A cordless mouse would provide greater flexibility.
- ➢ A CAL Log-book for daily entries must be maintained in each school.
- ➢ Important contact numbers must be posted in the CAL Classroom for immediate help from the CAL Resource Centre at Headquarters.
- ➢ The software must include concept-wise indication for teachers to understand how to help children process the information they have seen: how, how much, how often.
- ➢ A comprehensive Teacher Manual must be developed to provide clear guidelines to teachers.

Ernst & Young Foundation Team was concerned when it heard from external sources that there had been instances where Classroom equipment were missing. A directive from the Director-Education to all School Principals making them responsible/accountable for the equipment's safety helped in restoring EYF's confidence.

EYF was happy to confirm in the MoU that the ownership of the equipment would vest with the government, which was a concern expressed by the DoE.

Partners must agree on quantitative indicators for measurement of desired results.
In the case of the CAL Pilot, the pass percentage for the schools was ascertained before the start of the project which would then be compared with the pass percentage in the next year. Enrolment data was also accepted by both as a quantitative indicator. While qualitative indicators such as positive feedback from teachers, students etc are good indicators, for a corporate it is important that the success of the Pilot is also measurable in tangible terms.

The 200 schools in the Pilot were selected on pre-determined criteria by the DoE (representation in each of its zones, failure rates etc) so that the project would be applicable in diverse contexts across Delhi.

A corporate can play a role in developing a monitoring system that ensures, for example, additional monitoring for schools with poor pass percentage, schools in semi-rural areas where the knowledge of computers is minimal, schools in areas with perennial power shortage / no electrical connection etc.

[illegible] st-specific support and monitoring steps for the va [illegible]

DoE & EYF worked very closely in most of the areas, be it the voiceover, installation equipment in schools etc. This helped in a smoother and faster progress of the Pilot initiative. [illegible] focus should be to play to each other's strengths. Corporates can frequently supp [illegible] very swiftly mobilize the whole system to implement an initiative on a very large scale

The MoU provided for EYF representatives to participate in meetings with the differe stakeholders. In addition, the Director-Education instantly agreed to EYF's request to permitted to visit schools and check the impact of the project. The visit by an independent thir party like EYF also helped the DoE to receive unbiased feedback. [illegible] implementation, monitoring and evalua [illegible] to the whole project

Capacity and Skill-building

- Since the entire development of the software is an in-house endeavour. the capacity of the CAL Resource team and the entire IT Department has increased exponentially.
- Around 100 teachers have developed the capacity and the understanding of the methodology by which the way the multimedia content is made.
- Around 1100 teachers have been trained for 13 days each in operations of computers and handling of multimedia content, that is, 14300 man days of IT training has been given and that too in-house without involving any outside agency whatsoever.
- 200 Principals/Heads of Schools and all Education Officers have learnt and grown with the initiative.

Promotion of a Culture of Team Work

The importance of team work cannot be over emphasized in the development and implementation of a programme of this scale. A culture of teamwork has been strengthened in the following manner:

- Every subject has a team of four to five expert subject teachers, four to five fine artists and animators and around six multimedia programmers. The first draft is the result of brainstorming and intensive discussions among the subject experts. Discussions then follow with artists and programmers, and the draft is subsequently finalized.
- Each team member is given training in the other disciplines by the team members.
- Every Sunday, a discussion is held among the team members about the challenges faced by them during the week and the innovative solutions and ideas implemented by them. The entire team is thus very competitive while at the same time members help each other to become more effective.
- This core team comprises the master trainers who have trained 1100 teachers. Each member of the team is a facilitator for around 50 teachers who have been trained and helps them in case of any difficulty.
- As a team-building exercise, all the members went on a group tour to Manali, Vaishno Devi, Amritsar, which was contributory. This is really exceptional because normally employees expect the government department to pay for such excursions.

The team has a shared vision of what it wishes to achieve and an intense feeling of ownership of the CAL project. In growing and learning together, the team is going from strength to strength.

[illegible]

1. All the teachers involved in the development of CAL content were felicitat
by the Hon'ble CM in the State level launch of CAL on 5th of September 2005.
2. The implementation of CAL has been covered by all the major News Channel
india. To name a few, the programme running in classroom has recei
very favourable coverage in NDTV, Aaj Tak, Zee News, Star News, TOI,
News, Sahara, Channel 7, Total TV, Siti Cable etc[13].
3. The Department of Education, NCT of Delhi, has been awarded the Bro
Icon in the 9th National E-Governance Award in the Professional Category
Exemplary Leadership & ICT achievement of the year.
4. CALtoonZ also featured on the cover page of the May 2006 issue of "Animat
Today" magazine.

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[13] Annexure 8: Media Coverage

HAPTER 3

aluation of the Content

r the very successful implementation of the Pilot, the Department decided to extend CAL to asses in all schools. But before doing so, it was considered advisable to review the contents methodology of CAL with a group of eminent scholars in the field of Education and also holders, to obtain their comments/suggestions for further improvement. Accordingly, a day workshop was organised during May 25-30, 2005 in the CAL Resource Centre at rpur.

a. Accuracy and adequacy.
b. The perspective of child psychology
c. Pedagogy
d. The audio-visual perspective, i.e. colour, speed, smoothness of animation, use of the screen, special effects, music, narration, etc as well as other technical issues
e. Issues such as equity, diversity, secularity and equality

Keeping in view the scope of the workshop, persons with following specialisations were invited to participate in the workshop:

1. Eminent scholars and social scientists.
2. Experts in the fine arts specialising in animation
3. Persons involved in the production of educational films
4. Experts on pedagogy
5. Teacher trainers
6. Curriculum developers from NCERT and SCERT
7. Specialists from the field of multi-media.

A 20 member Task Force was constituted under the Chairmanship of Prof. V.K. Tripathi I.I.T., Delhi with the following members :

Sl. No.	**Name**	**Particulars**
1	Prof. V.K. Tripathi	Professor, Physics. IIT Delhi
2	Prof. Ajit Mohanty	Chairperson, Zakir Hussain Centre for Educational Studies, Jawahar Lal Nehru University, New Delhi-67.
3	Prof. Dharam Prakash	Head, Media Production Centre, CIET, NCERT.
4	Prof. K.G. Rastogi	Former HoD, Department of Hindi, NCERT
5	Prof. Poonam Batra	Co-ordinator, B.EL.Ed. Colleges, Delhi University.
6	Prof. I. Zaidi	HoD, Department of History, Jamia Millia Islamia
7	Prof. Vasu	Professor,Delhi College of Art, New Delhi.
8	Dr. Usha Bhatnagar	HoD, Department of English, Shyama Prasad Mukherje College, Delhi University,
9	Dr. Pawan Sudhir	Reader and Head, Course Material Development and Evaluation, SCERT Delhi.
10	Dr.Jay Narain Kaushik	Retired Principal, JBT College.
11	Dr. Arvind Mishra	Senior Lecturer, Department of Psychology, Jamia Millia Islamia.
12	Dr. Rajesh Kumar	Principal, DIET, Pitampura, Delhi.
13	Dr. Raj Kumar Arya	Joint Director, NIOS, B-31, Kailash Colony, New Delhi.
14	Shri S.S. Rastogi	Retired Principal(Department of Education)
15	Ms. Harsh Kumari	H.M., CIE Basic School, Delhi University, Delhi.
16	Shri Ashok Gogia	Ex-HoD, Department of Maths, Hans Raj Model School, Punjabi Bagh.
17	Shri Vijay Kumar	Vice Principal(Department of Education)
18	Mrs. Lilly Bhardwaj	Retd. Senior Lecturer(English), Department of Education.
19	Mrs. Sujatha Balachander	EY Foundation
20	Mrs. Leena Jain	Audio Specialist
21	Shri Ashok Kumar	Project Manager, CAL Resource Centre.

Schedule of the Workshop

e workshop ran for five full days as per the schedule below:

1: First Session - Introductory session
Second Session - Subject-wise team work

k: First Session - Combined session
Second Session - Subject-wise session

First Session - Subject-wise team work
Second Session - Concluding session

roceedings

luction to CAL

ask Force members were first introduced to the magical world of CAL by the CAL team. presentation included:

1. Background and Situational Analysis
2. Goals of CAL
3. Philosophy behind CAL
4. Process of making CAL
5. Implementation of CAL in the schools of Delhi Government.
6. Findings of international studies on Computer Aided Learning and their applicability in the Indian context
7. Comments of children studying with the aid of CAL
8. Difficulties being faced in the entire process
9. Glimpses of CAL
10. What others have said about CAL, including the media.

TERMS OF REFERENCE

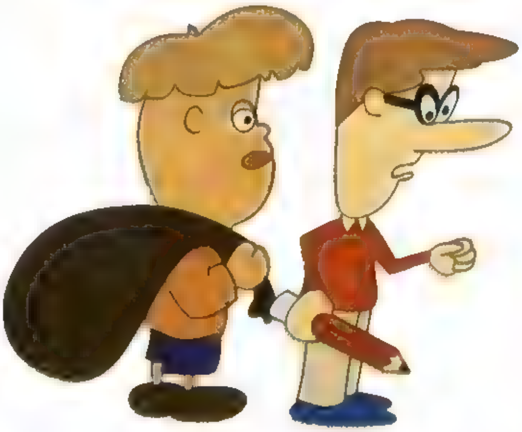
It would appear that this was the first workshop of its kind in the country, and th
Department did not really have any precedents to go by while framing the Terms
Reference to examine CAL. After very exhaustive discussions on the matter, the follow
were agreed upon.

Examine CAL with reference to:

1. Accuracy and adequacy of the content
2. Pedagogical issues such as how many times a word or concept should be repeat structure of a lesson, how to introduce a concept etc.
3. Reinforcement of the learnings so that the module leads children not only to so knowledge but better understanding and application
4. Optimal utilisation of CAL for transfer of basic skills and information in a structu format
5. Optimal utilisation of CAL in fostering inquiry and exploration, ability to analyse a synthesize the information
6. Acquisition of higher order cognitive & social skills such as problem-solving, flexibili agility, resourcefulness, collaboration and team work; i.e. “learning how to learn”
7. Colour, sound, speed and other aspects of the content from a production angle
8. Dovetailing of educational value and the “fun” element so that the content does n digress from the main learning objective and at the same time retains the interest of t child
9. Suitability of the content presentation keeping in mind the socio-economic structure the target audience.
10. Areas of social concern:
    a. Secularity of the content
    b. Gender equity
    c. Democracy
    d. Respect for elders
    e. Respect for the disabled
    f. Respect for all religions
    g. Concern for animals
    h. Respect for the environment
11. Three A-s for education i.e. Anyone, Anytime, Anywhere (web-based)
12. How the methodology may be useful not only at sophisticated levels but in everyday living from agricultural practice to banking to health services, entertainment, information exchange etc.
13. How the content may enable a child to get better scores in all the exams in general, and public and competitive exams in particular
14. Any other relevant issue, with the permission of the Chairman.

Process for Review of Content

- The members of the Task Force were divided into five different groups to look into the contents of the five different subjects namely Hindi, English, Maths, Science and Social Science. The members were supported by in-house subject resource persons as well as multimedia developers and artists.
- Care was taken to ensure that each group contained subject specialists, a psychologist, and specialists in curriculum development and multimedia who could examine the content and suggest improvements in their respective fields of specialisation. Some experts moved from group to group.
- The Task Force went through every frame of the CAL contents, the points of reference having already been outlined in the introductory n.
- The findings of the subject groups were discussed in the plenary session comprising of all the Task Force members, and suggestions and guidelines decided upon.
- After going through the entire contents of class VI and whatever had been prepared for Class X, subject-wise, the Task Force came up with very valuable suggestions and recommendations which will help to improve the overall content and presentation of CALtoonZ and make it more meaningful and effective for the children for whom this whole initiative was undertaken. The Task Force urged the Department to ensure the successful implementation of the programme by incorporating their recommendations.
- The compilation of the recommendations of the Review Task Force which are common to all subjects, are given below. Interestingly, and in most cases, the Task Force commended the methodology followed by CAL and endorsed it, while in others it has suggested changes. This review has proved immensely valuable in deciding the way forward in CALtoonZ



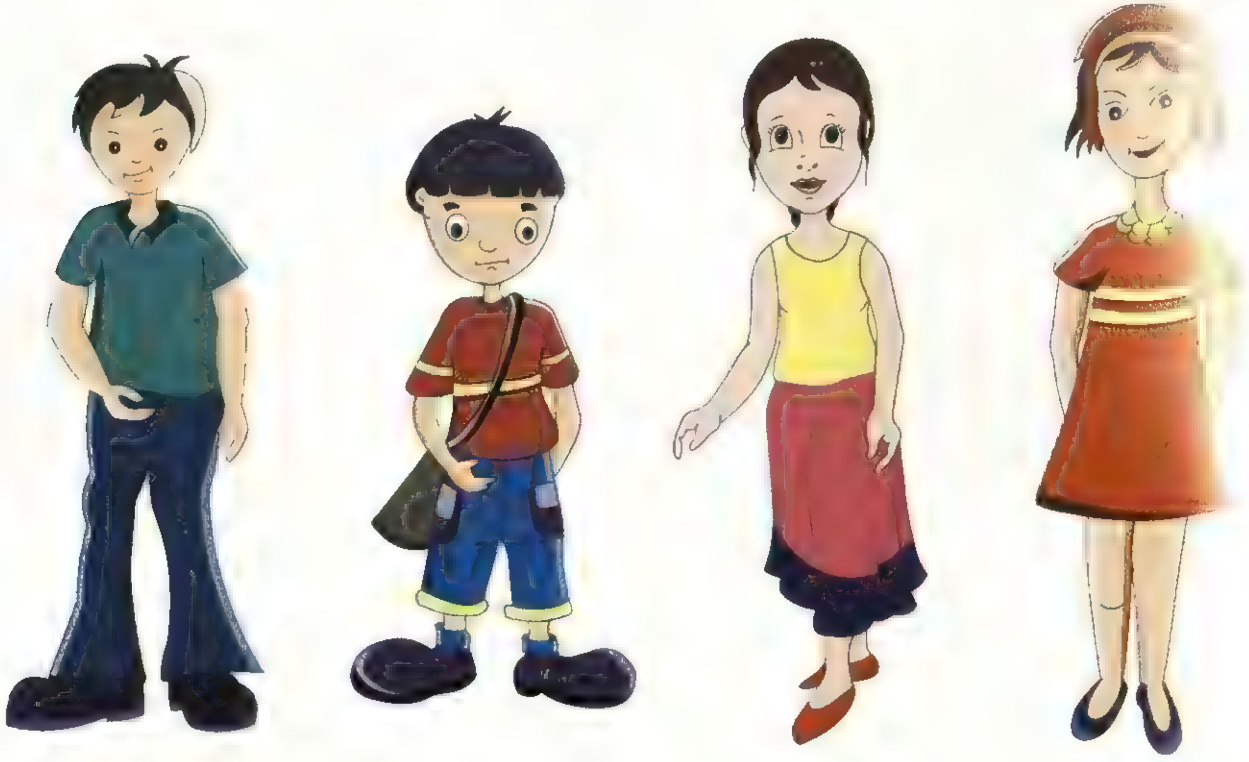
RECOMMENDATIONS

CHARACTERS

The Task Force made the following suggestions for the characters being used in all the subjects:-

- Use names from all religious communities

The Task Force observed that the characters should be from all religious communities and tha stereo types should be used. All the characters should share similar features, clothes etc, un there is a specific reason for showing differences e.g. Eskimos, or the dress of a partic State/region in India, etc.



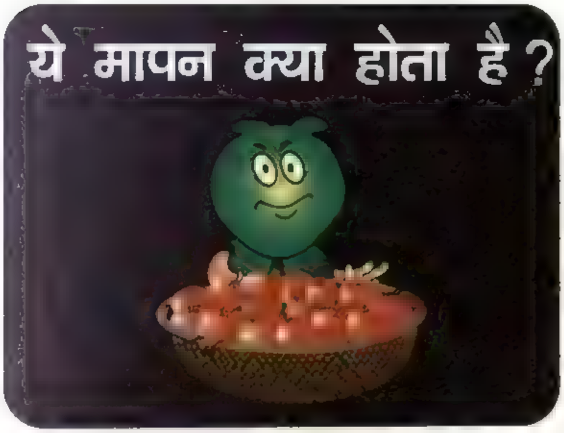
Sahil Aman Sherry Charu

Class VI - Social Studies

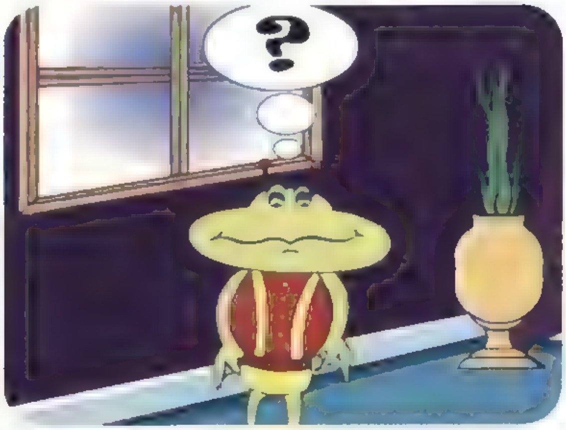
Characters should ask questions

The script should include lots of questioning by the characters.

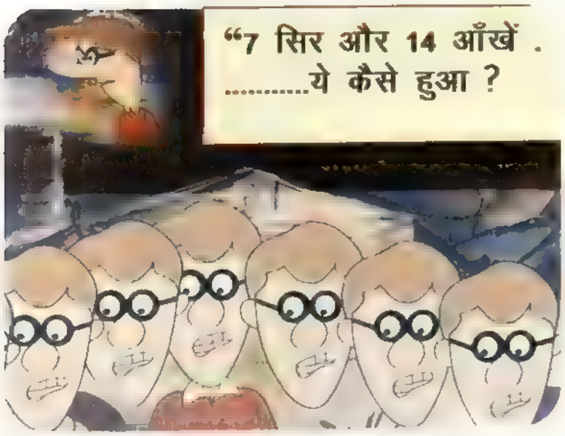
- This will reduce children's hesitation in asking questions in the classroom.
- It will encourage maximum participation of children in classroom deliberations.



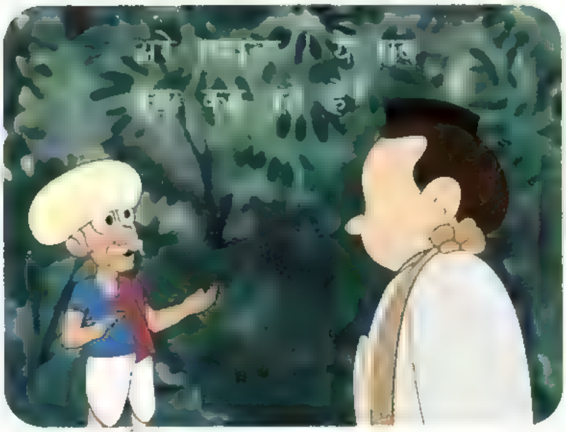
Science Class VI



English Class VI



Maths Class VI



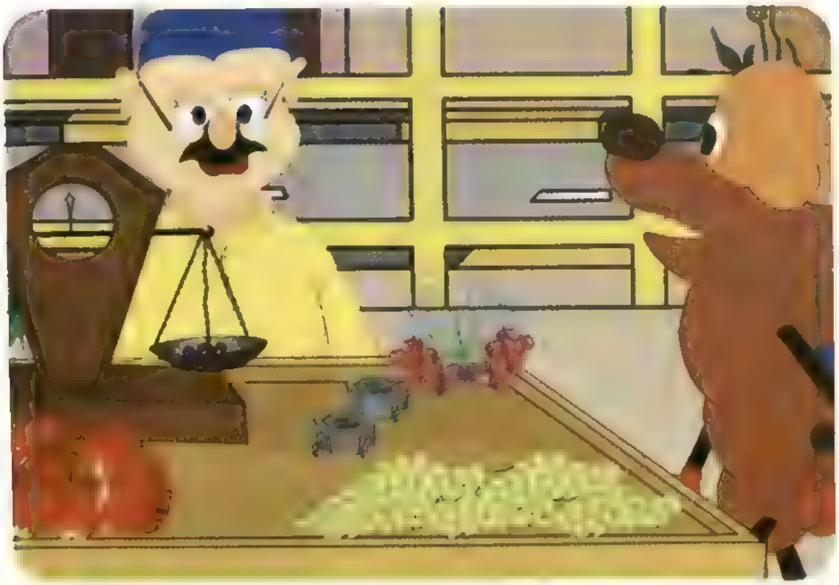
Hindi - Class VI

In the above visuals, the characters are asking questions and after the question is asked, the explanation is provided and the chapter moves forward. The CAL methodology was endorsed.

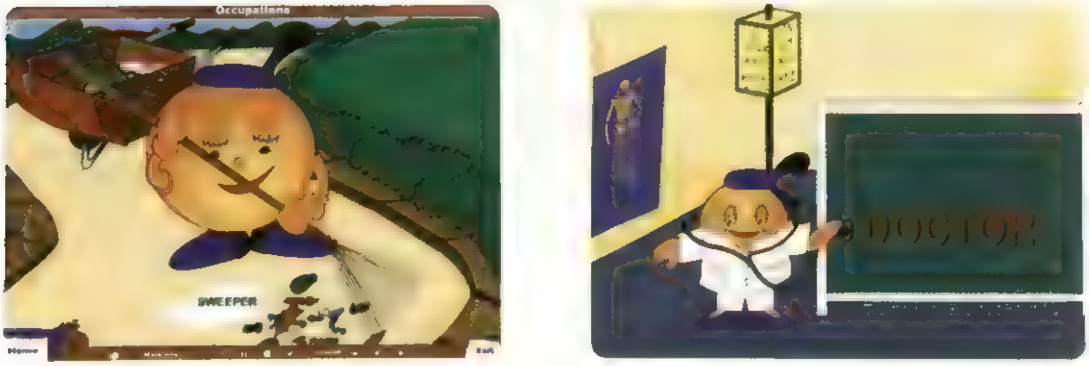
[illegible]

A child relates more to everyday, real life situations. If a topic is explained through a life situation, the topic becomes easy to understand and at the same time the child feels the topic is useful for him in daily life also and is more interested in learning it.

Thus, buying fruits by weight, adding the weight of fruits, have been used to teach the of measurement, and the Task Force endorsed the approach followed by CAL.



Maths Class VI

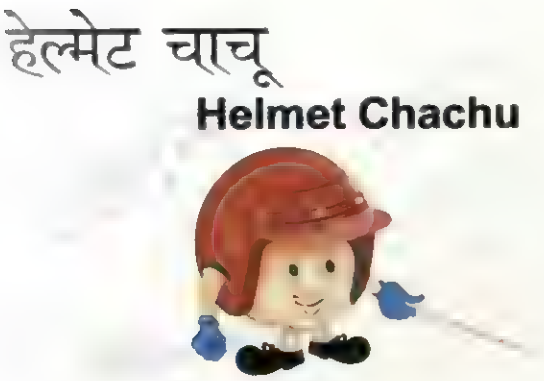


English Class VI

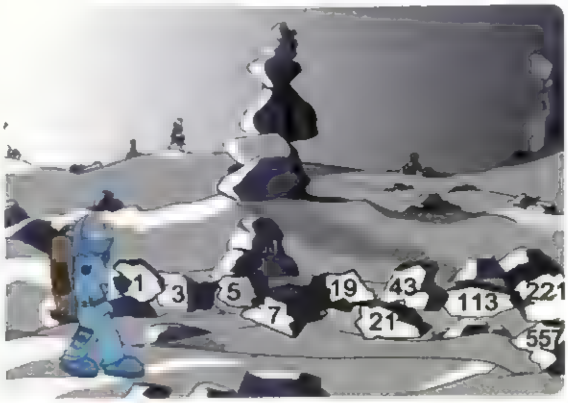
In the chapter 'Professions', in English, characters like Doctor, Sweeper etc., whom a child is familiar with and can easily relate to, have been depicted.

haracters relevant to the context should be present in one screen

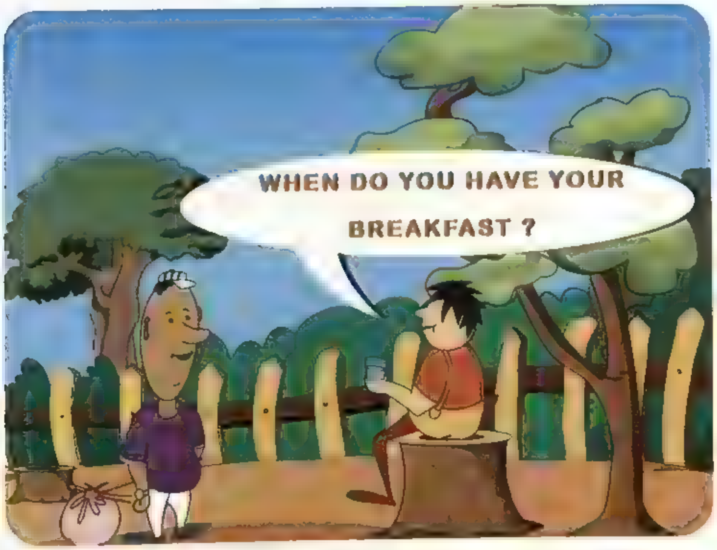
the characters relevant to the context should be present on the screen at a particular point me. The characters that are not relevant to the story line should not be present in the en unnecessarily otherwise they will divert attention.



Science Class VI



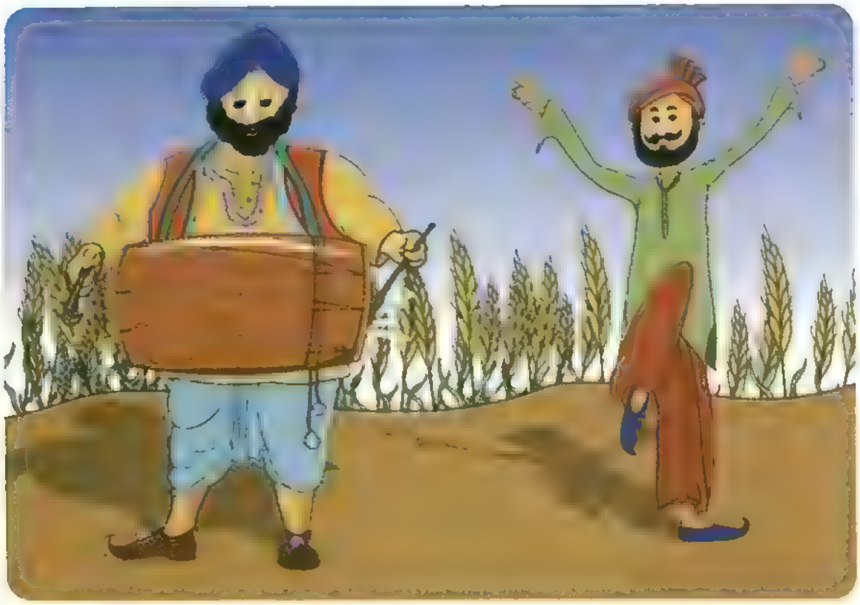
Maths Class VI


WHEN DO YOU HAVE YOUR BREAKFAST ?

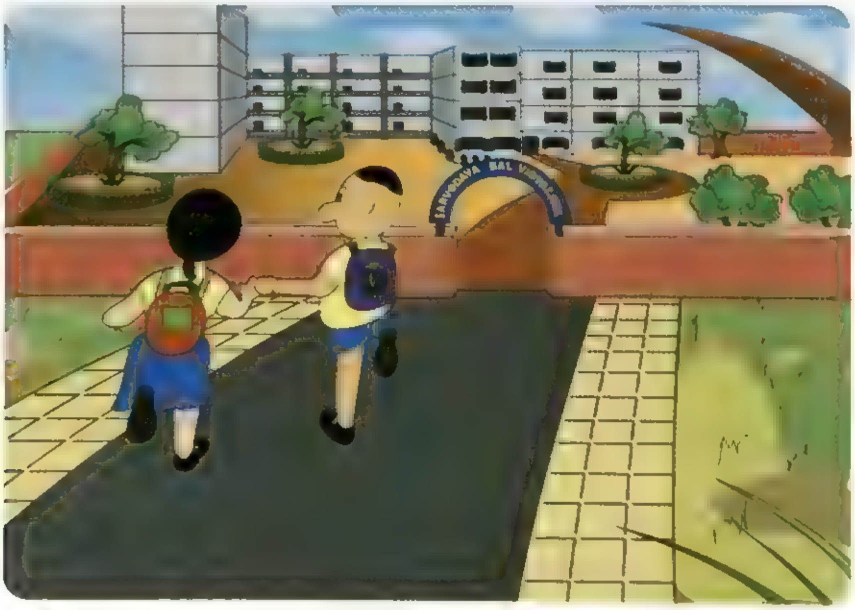
English Class VI

Care has been taken to keep only one character on the screen when a concept is being delivered, like the situations in the above scenes. More than one character is shown on the screen only where required. For example, in the visual shown above, a dialogue can be shown only if there are two or more characters. The CAL team has been following this recommendation.

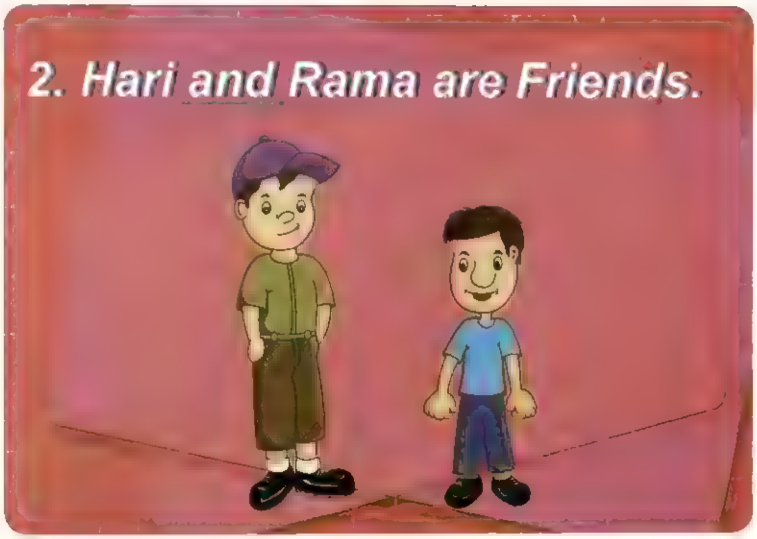
Characters should have Indian names



In the Unit on Names of Months, Santu Singh and Bantu Singh celebrate Baisakhi in the visu of the month of April, which is very much an Indian situation.

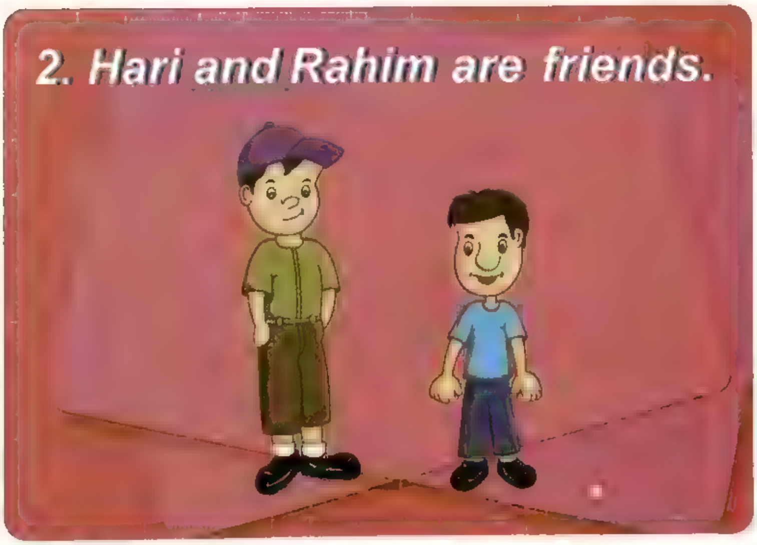


Radhika and Krishna are going to school.



2. Hari and Rama are Friends.

Before review



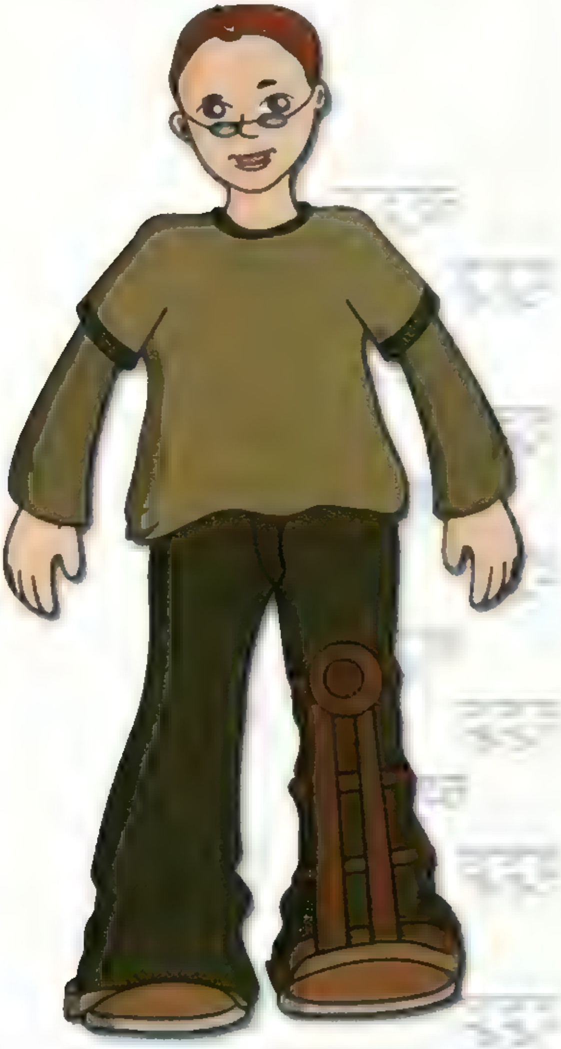
2. Hari and Rahim are friends.

After review

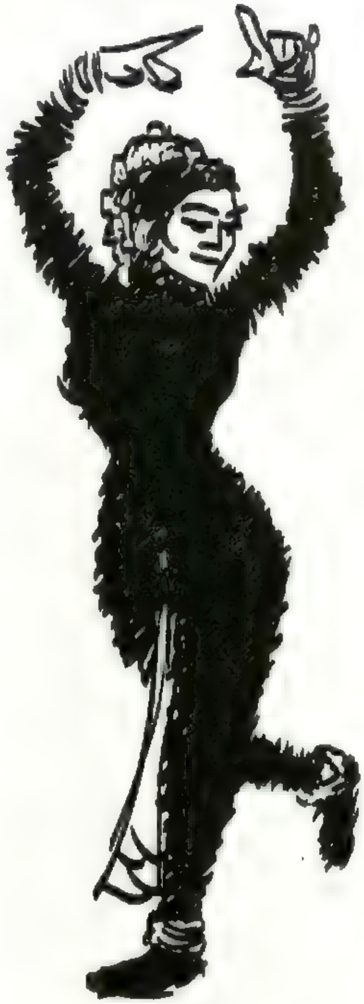
In the above visuals, an effort has been made to pass a subtle secular message. Here an emphasis also been laid on the use of simple sentence formation.

Characters from differently abled groups should be included

Differently abled children and adults should be shown to work hand in hand with others so t differently abled children can get inspiration from the characters and other children understand t differently abled children are really not so different. Some eminent achievers should also be describ and the inclusion of such characters in CAL has been appreciated by the Task Force.



Ashok



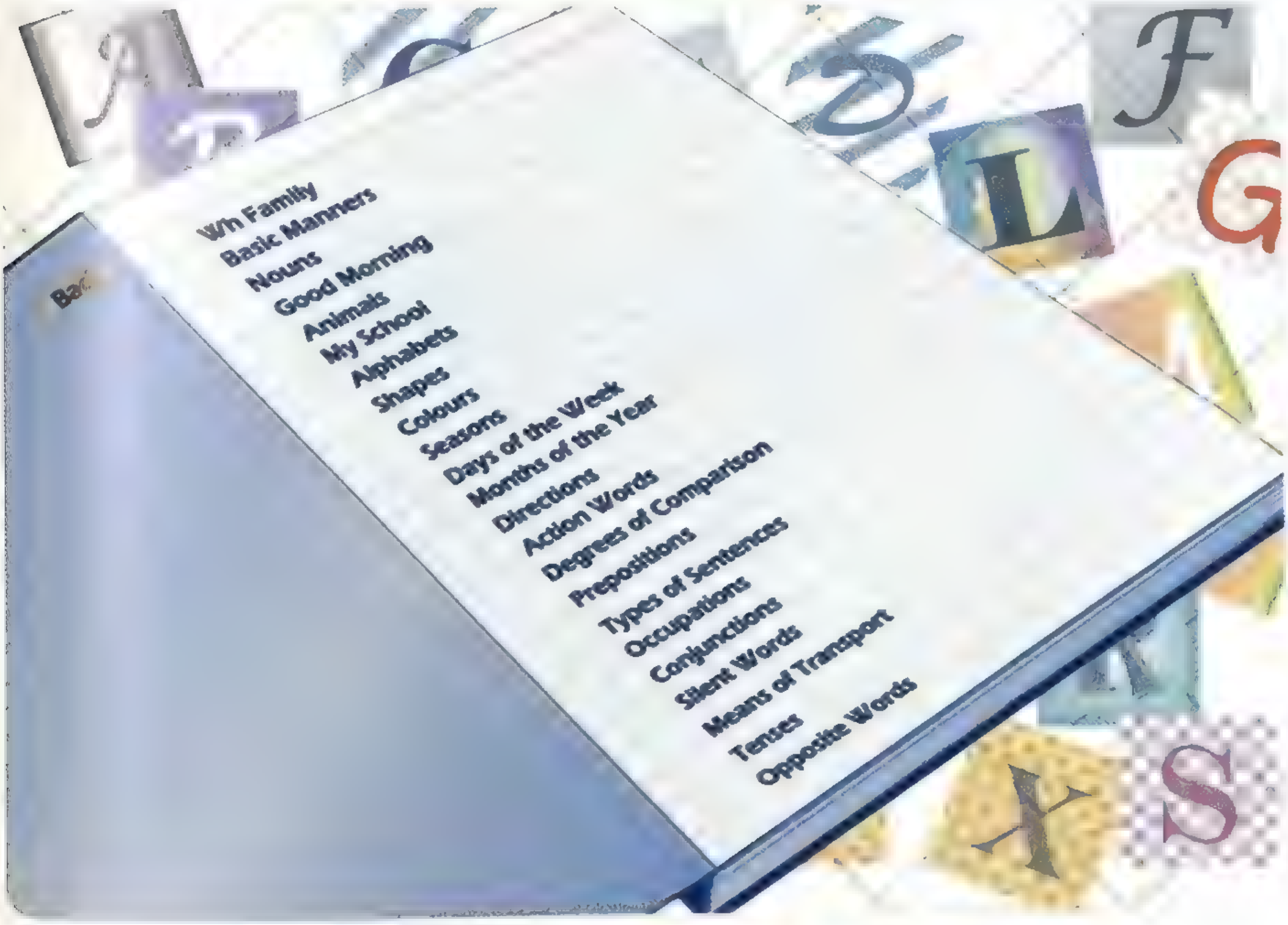
Sudha Chandran

CONCEPT - MAPPING

A proper process of concept mapping should be put in place and followed. Before venturing into script-writing, a clear understanding of the concept is required and every effort should be made to make the text clearer to the students.

The following suggestions were also made for the effective use of concept mapping:-

An [illegible] listing of lessons [illegible] to the activities of the respective class [illegible]



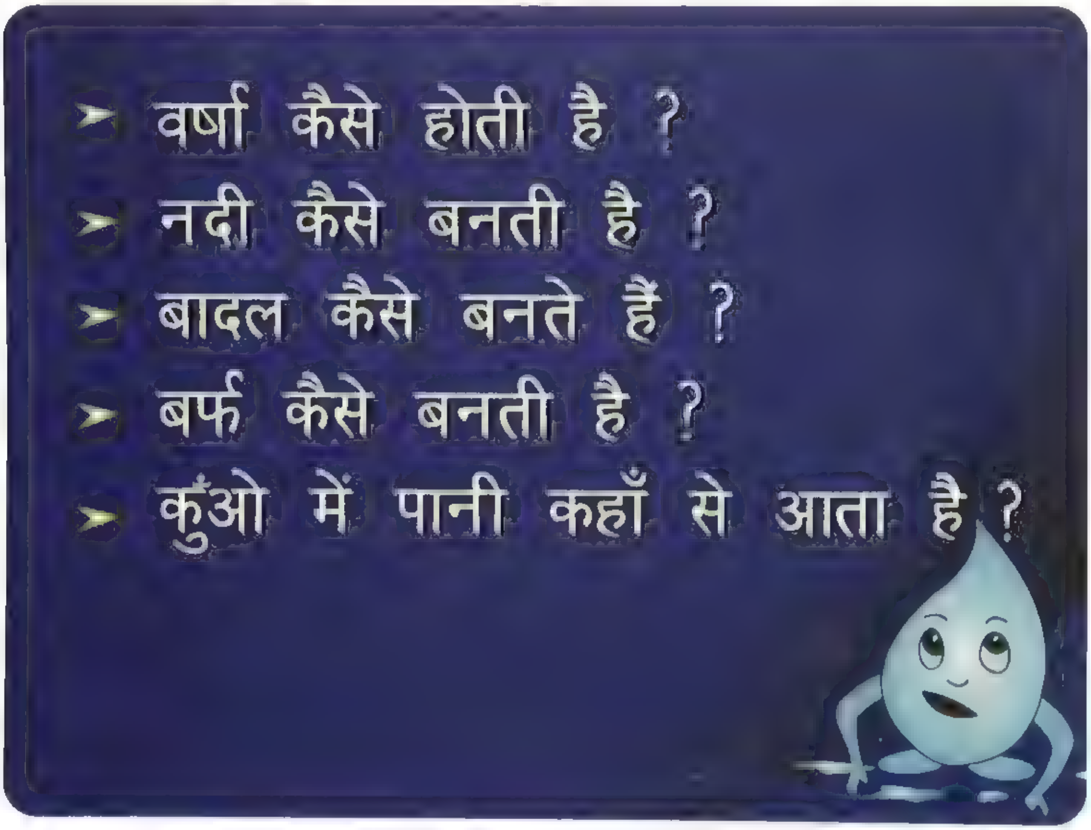
Wh Family
Basic Manners
Nouns
Good Morning
Animals
My School
Alphabets
Shapes
Colours
Seasons
Days of the Week
Months of the Year
Directions
Action Words
Degrees of Comparison
Prepositions
Types of Sentences
Occupations
Conjunctions
Silent Words
Means of Transport
Tenses
Opposite Words

Index page **English Class VI**

The English module for Class VI comprehensively covers topics taught in Classes I to V.

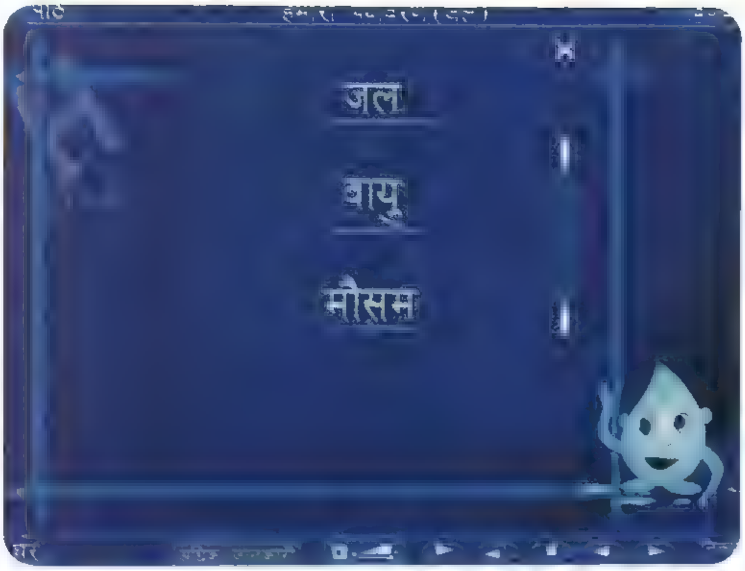
The subject expert must ensure that proper weightage has been given to every topic o
prescribed syllabus and no part of the recommended syllabus is left uncovered.

Each unit must be clearly divided into chapters, each chapter into topics and sub-topics in
a manner that lower order concepts come first followed by higher order concepts, with learn
objectives clearly stated, so that the teaching-learning process becomes interest
transparent, meaningful and useful.



- वर्षा कैसे होती है ?
- नदी कैसे बनती है ?
- बादल कैसे बनते हैं ?
- बर्फ कैसे बनती है ?
- कुंओ में पानी कहाँ से आता है ?

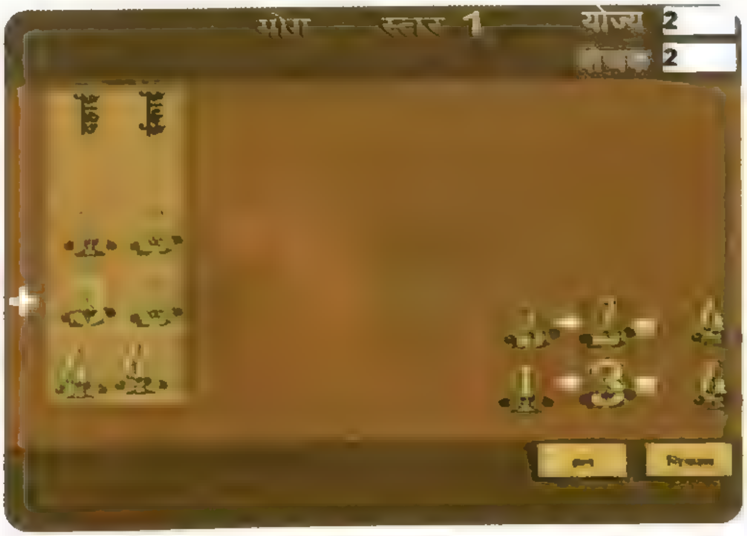
which links the lessons and messages should be made.

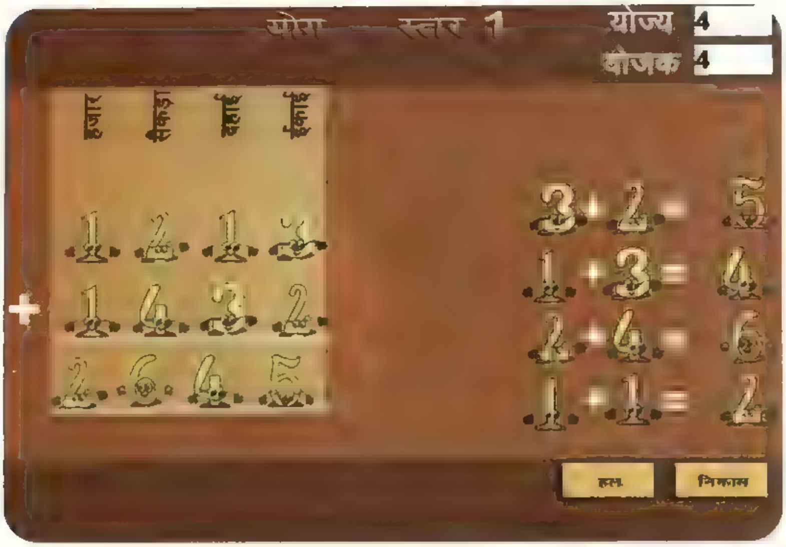


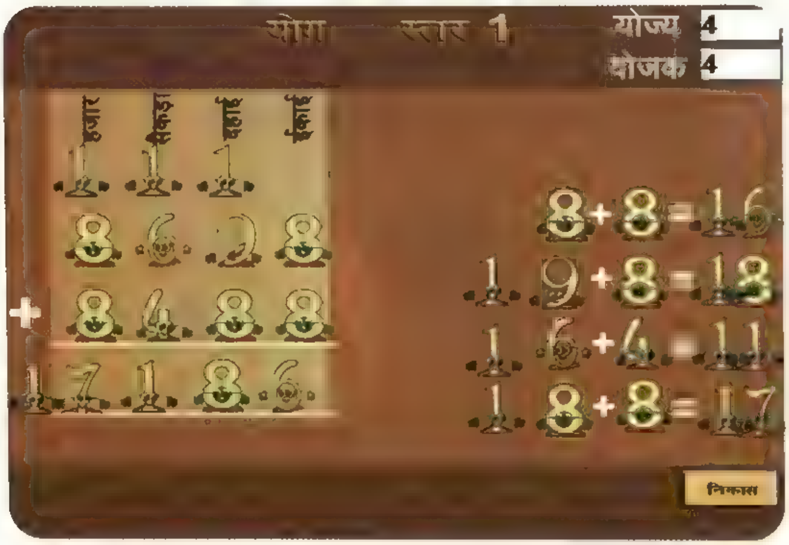
Science Class VI

F topic and sub-topic in the chapter, links have been made available so that at any time d teaching-learning process in the classroom, any link can be selected as per the re nt for accessing different concepts easily and for facilitating repetition.

thing, the subject expert should sequence topics such that the shall move from simple to complex, easy to difficult.




योग स्तर 1
योज्य 4
योजक 4
हजार
सैकड़ा
दहाई
इकाई
1 2 1 3
+ 1 4 3 2
2 6 4 5
3+2= 5
1+3= 4
2+4= 6
1+1= 2
हल
निकास

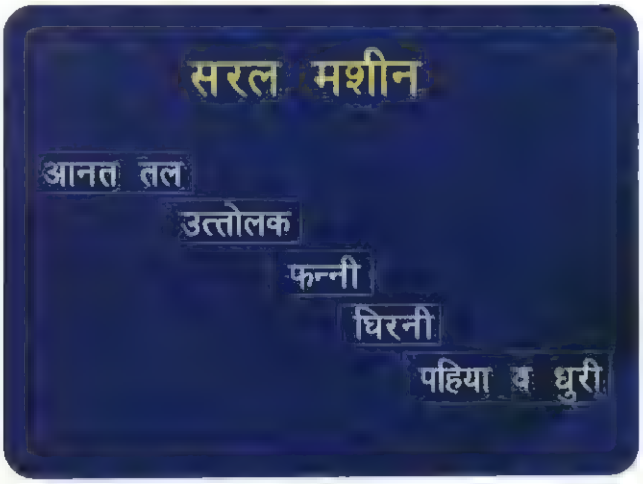

योग स्तर 1
योज्य 4
योजक 4
हजार
सैकड़ा
दहाई
इकाई
1 1 1
8 6 9 8
+ 8 4 8 8
1 7 1 8 6
8+8=16
1 9+8=18
1 6+4=11
1 8+8=17
निकास

While testing topics and subtopics, the subject expert must clearly identify those areas that are difficult for children to comprehend.

In identifying topics that children find difficult to understand or teachers find difficult to teach, subject-experts will be able to ensure that such topics are given due weightage in the multi-media package. The unit must present the information in several different ways and provide more opportunities for students to process the information presented than easier topics.

[illegible]

ologically it is a proven fact that a child has a low attention span. Keeping this factor in t was suggested that longer topics may be broken into smaller units each with a single g objective. This break up of lessons will break the monotony of the chapter; by sing one small learning objective at a time, students will be kept engaged.



सरल मशीन

आनत तल

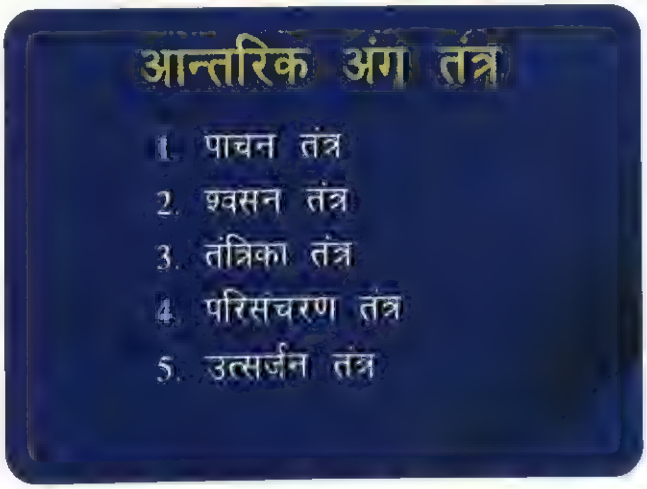
उत्तोलक

फन्नी

घिरनी

पहिया व धुरी

opic Simple Machines, the different kinds of simple machines are clearly listed before ind is taken up separately.



आन्तरिक अंग तंत्र

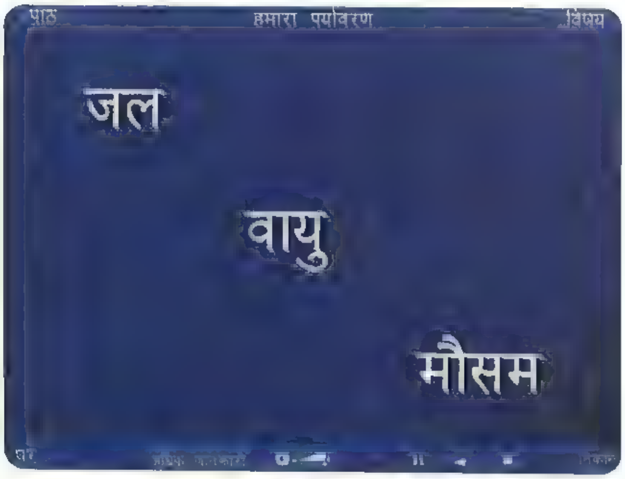
1. पाचन तंत्र
2. श्वसन तंत्र
3. तंत्रिका तंत्र
4. परिसंचरण तंत्र
5. उत्सर्जन तंत्र

The main topic 'Human Organ System' has been divided into five sub topics and explained in detail.

DESIGNING THE LESSON

The design of the [illegible] programme will handle the [illegible] the [illegible] Environmental [illegible] [illegible] the sequence of the lesson plan.

The Chapter and the theme [illegible] topic to begin.


पाठ
हमारा पर्यावरण
विषय
जल
वायु
मौसम
घर
अधिक जानकारी
निकास

At the beginning of each unit, the [illegible] Learning Objectives come up automatically.

Nouns

A Noun is the name of a person, place or a thing.

Person-Yasmin, Raghu, Boy, Girl.
Place-Delhi, Mumbai, Agra.
Thing-a table, a chair, a book.

Kinds of nouns:

There are four kinds of nouns:-

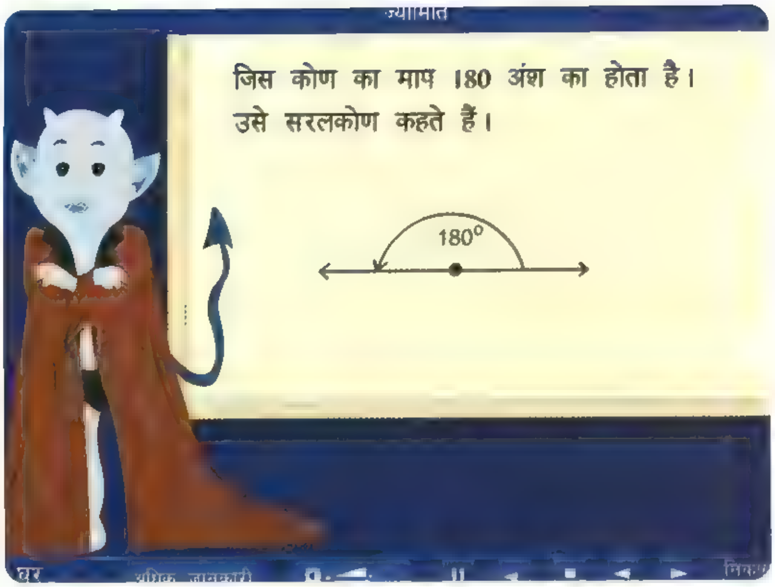
Common nouns:-a noun common to all persons, places or things is called a common noun, for example; city, boy, cow etc.

Proper nouns:-a proper noun is the special name of a person or place, example; Akbar, London, etc.

Kinds of nouns:

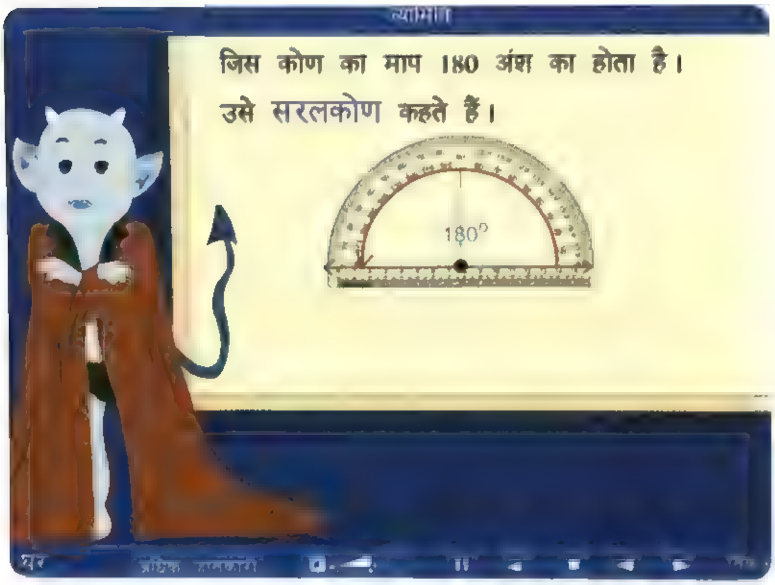
Abstract nouns:- an abstract noun is the name of something which we can neither see nor touch,for example; honesty, courage, hunger, health etc.

Collective nouns:-A noun that stands for a collection of persons or things is called a collective noun, such as, crowd, army, bouquet, herd etc.


ज्यामिति
180°
घर
अधिक जानकारी
निकास

जिस कोण का माप 180 अंश का होता है।
उसे सरलकोण कहते हैं।

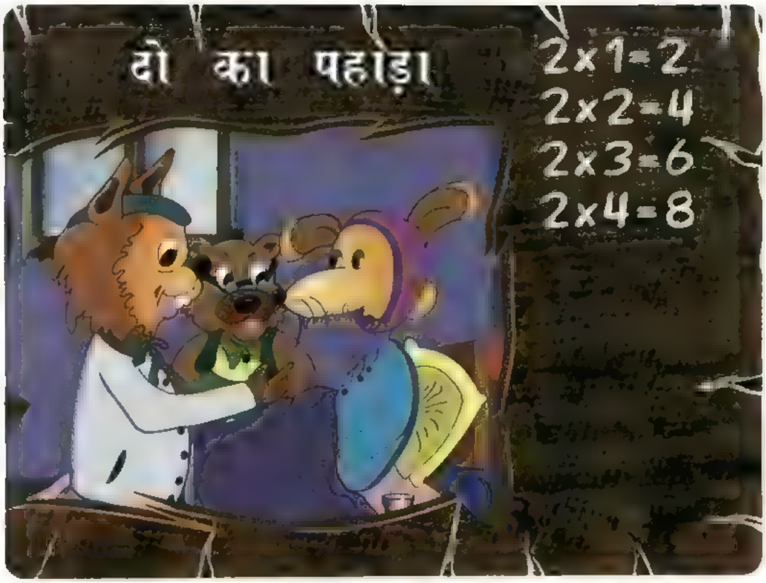
Before review


ज्यामिति
180°
घर
अधिक जानकारी

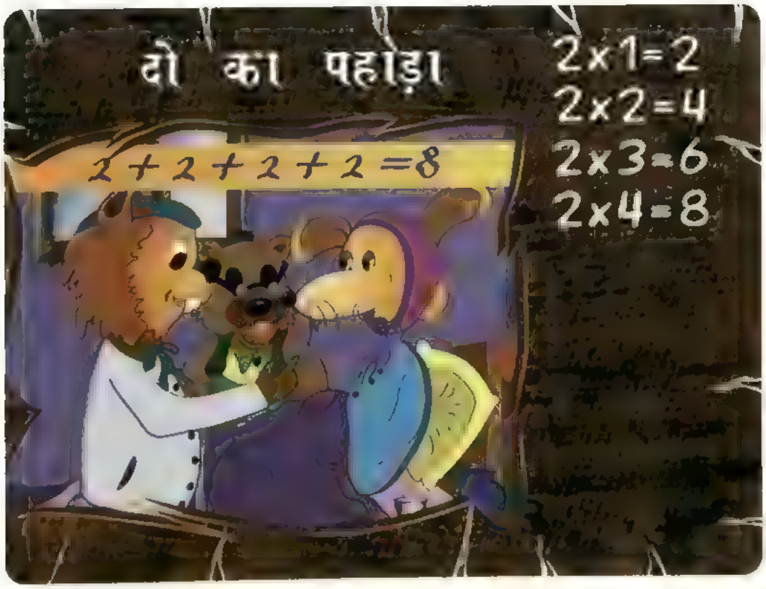
जिस कोण का माप 180 अंश का होता है।
उसे सरलकोण कहते हैं।

After review

In the scene after review, **a protractor ('D')** has been used to measure the angle of 180° to give a clear understanding of angle and its measurement.


दो का पहाड़ा
2x1=2
2x2=4
2x3=6
2x4=8

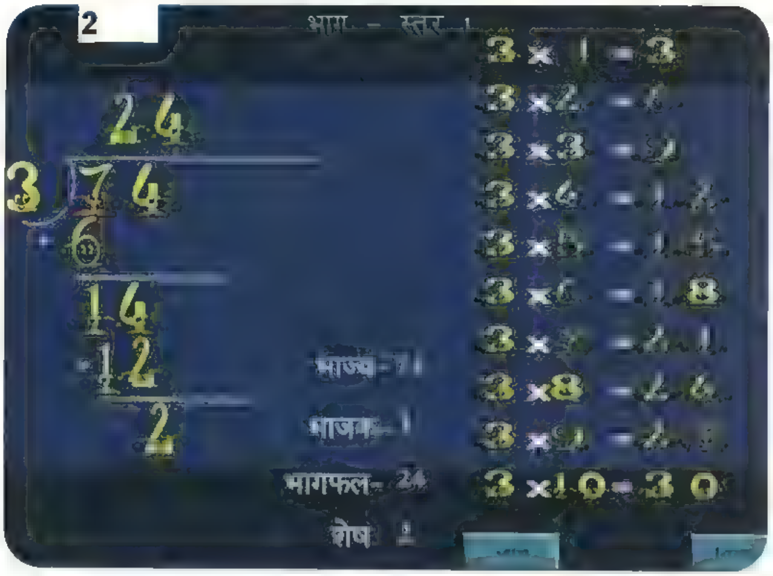
Before review


दो का पहाड़ा
2+2+2+2=8
2x1=2
2x2=4
2x3=6
2x4=8

After review

Before the review (talk), the concept was given directly while after the review (below), the same concept has been clarified by showing that multiplication is really only repeated addition i.e. 2+2+2+2=8 (2x4=8)

It would be an added advantage to [illegible] practical knowledge [illegible] when [illegible] a new Tutorial [illegible] should be made to Tables that Each Learner already knows.


2

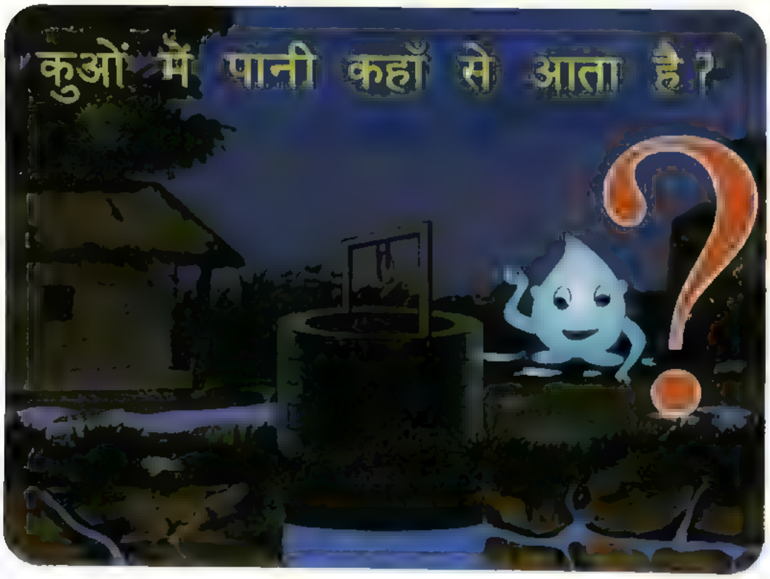
भाग – स्तर 1

24
3)74
-6
14
-12
2

भाज्य- 74
भाजक- 3
भागफल- 24
शेष 2

3 x 1 = 3
3 x 2 = 6
3 x 3 = 9
3 x 4 = 12
3 x 5 = 15
3 x 6 = 18
3 x 7 = 21
3 x 8 = 24
3 x 9 = 27
3 x 10 = 30

Posing a question while introducing a concept will get children [illegible] thinking.

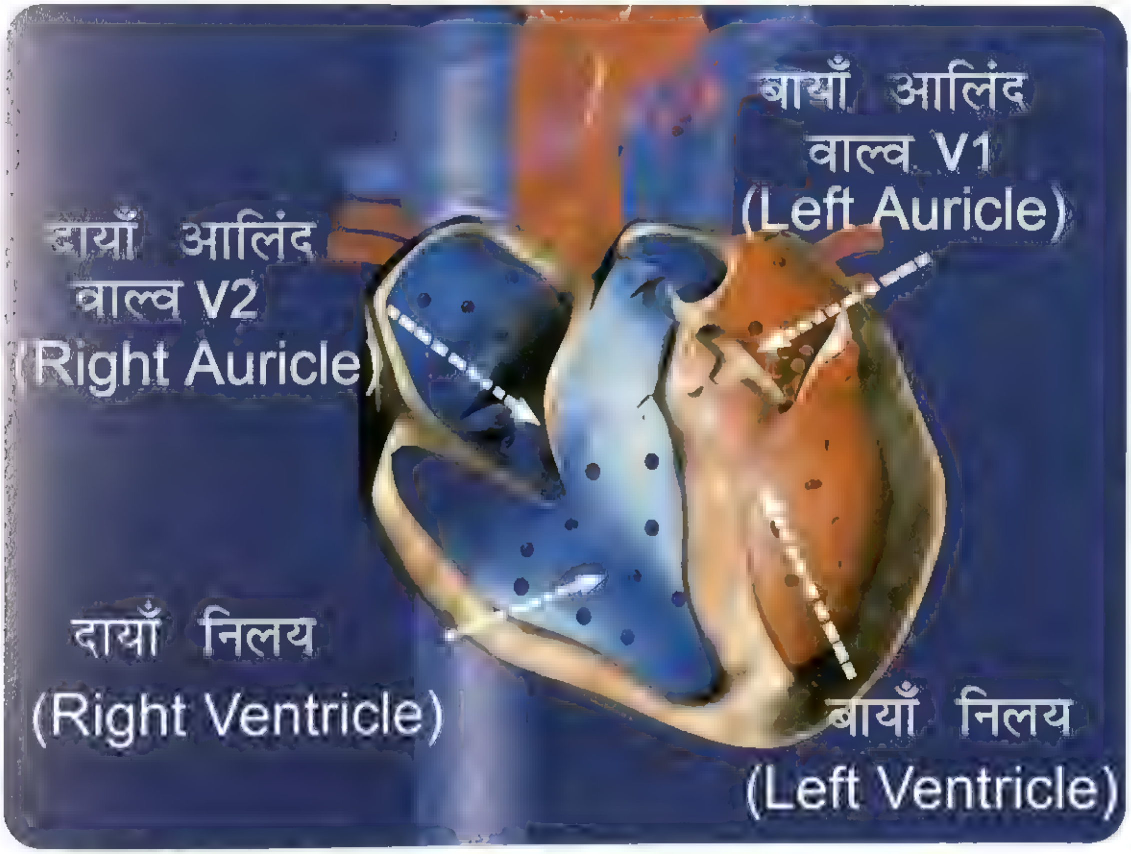


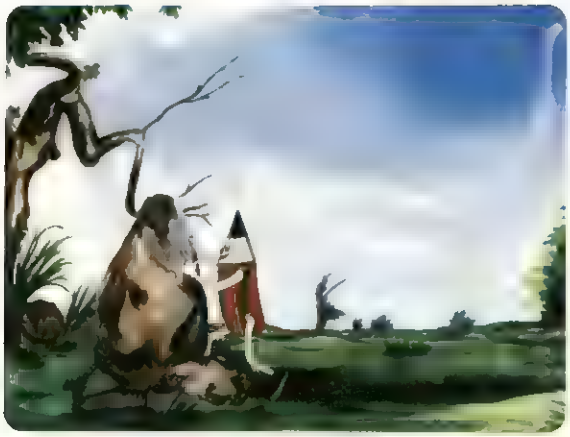
[illegible]

F ample, the functioning of the heart is a difficult topic for children to comprehend. C n will grasp the concept quickly, if they first of all see a model of a heart beating and hear t ultaneous pumping of the heart.

[illegible]

H seen the model of the heart pumping, the next screen helps students understand the d ns of flow of impure and purified blood and finally the parts and their names which they h learn.

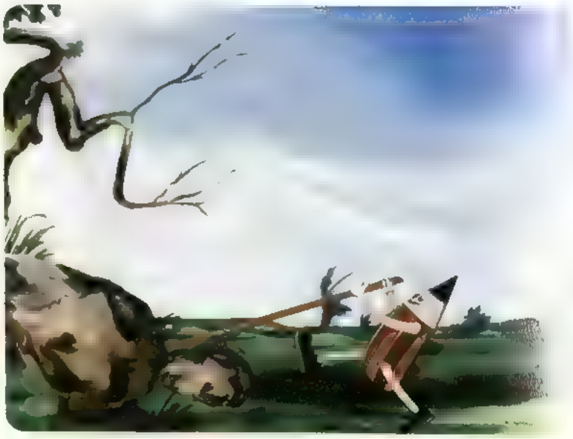

बायाँ आलिंद वाल्व V1
(Left Auricle)
दायाँ आलिंद वाल्व V2
(Right Auricle)
दायाँ निलय
(Right Ventricle)
बायाँ निलय
(Left Ventricle)

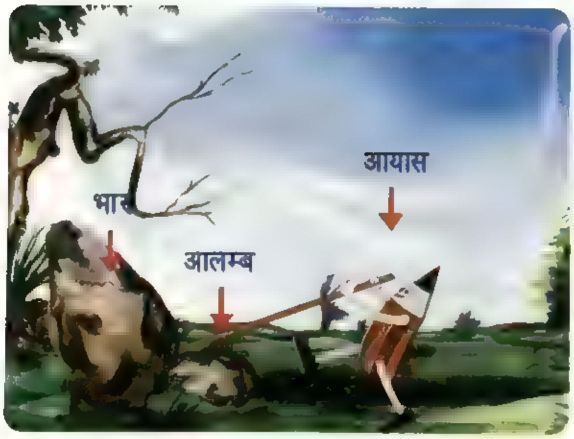


उत्तोलक (Lever)

General situation is known: where Achhu t to move some heavy object, but is unable t so.

The solution is also generally known: Achhu takes the help of a rod or a stick to move the same object and is able to move it now.

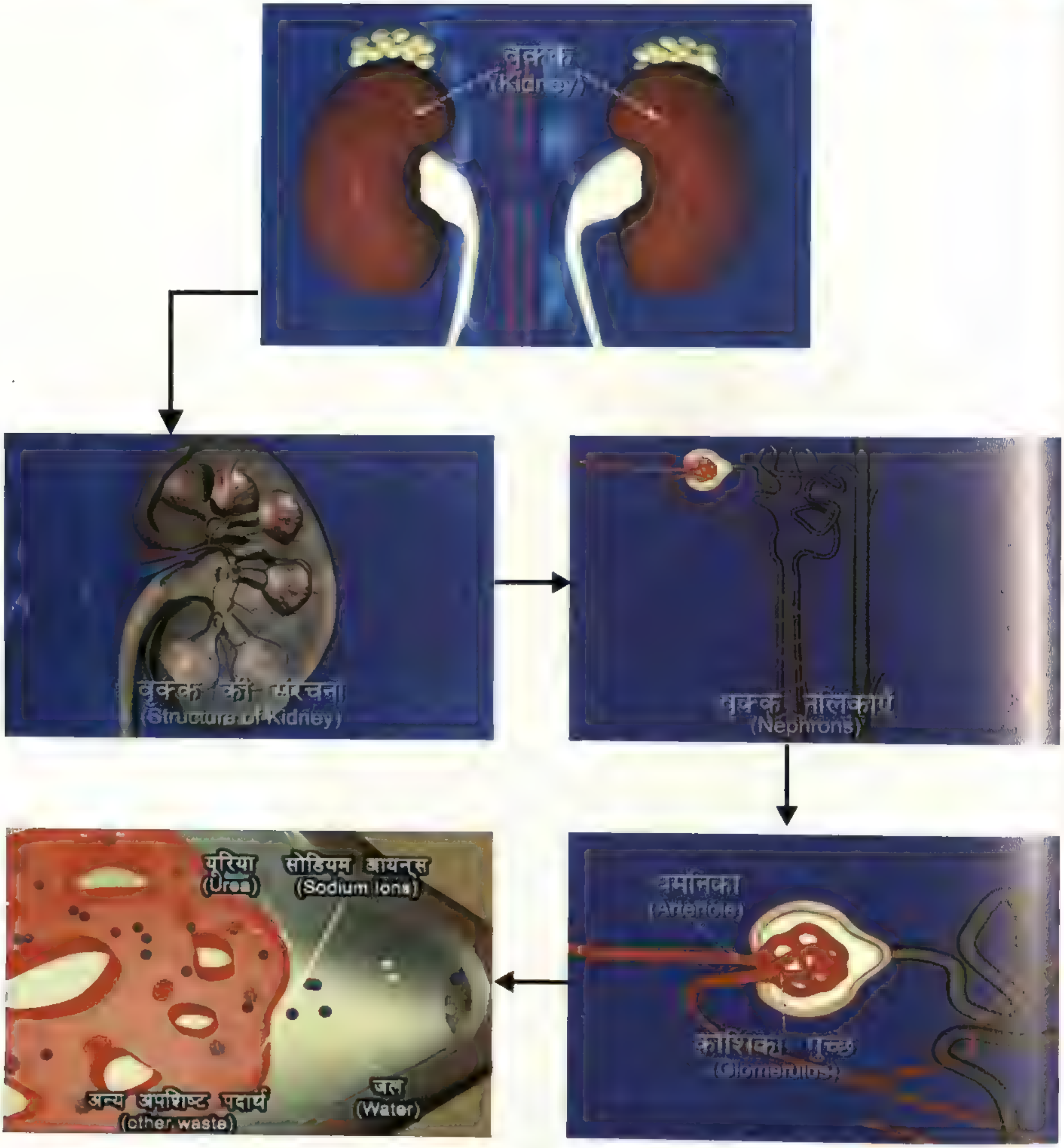




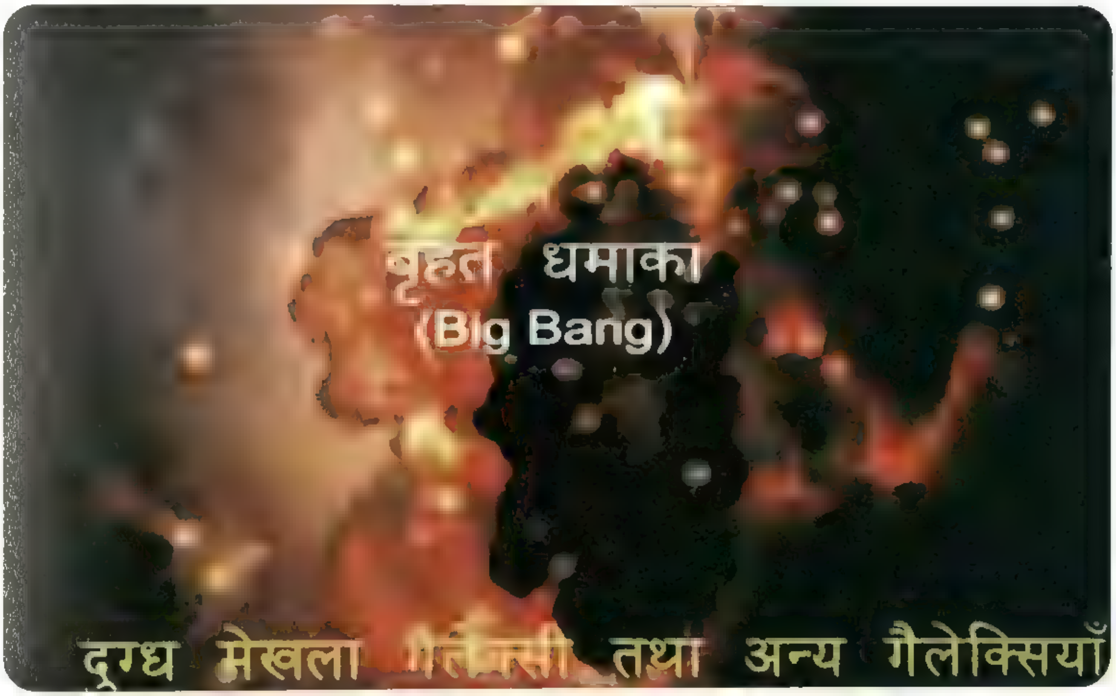
The concept is explained: This stick acts as a lever and makes the work simple. Here the learner can easily understand how a simple machine 'lever' works by load, fulcrum and effort.

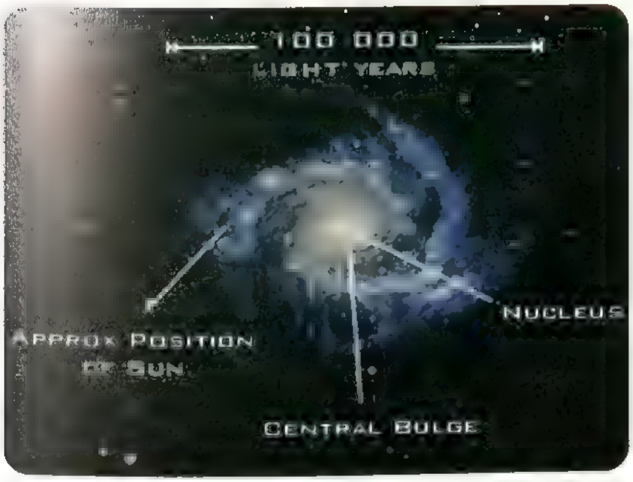
[illegible]

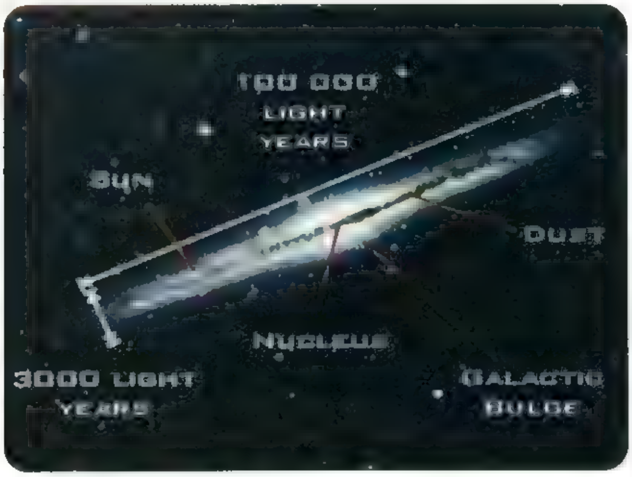
of all, a complex concept has to be given a very simple explanation followed by the lex and abstract facts. For example, the location of the kidneys should first be shown in ure of the human body then it should be explained how blood from all over the body is ed to the kidney, it is cleaned there and sent again to the heart to be pumped to the body and the waste separated from the blood in the cleaning process is sent to the ry bladder to be discharged as urine.

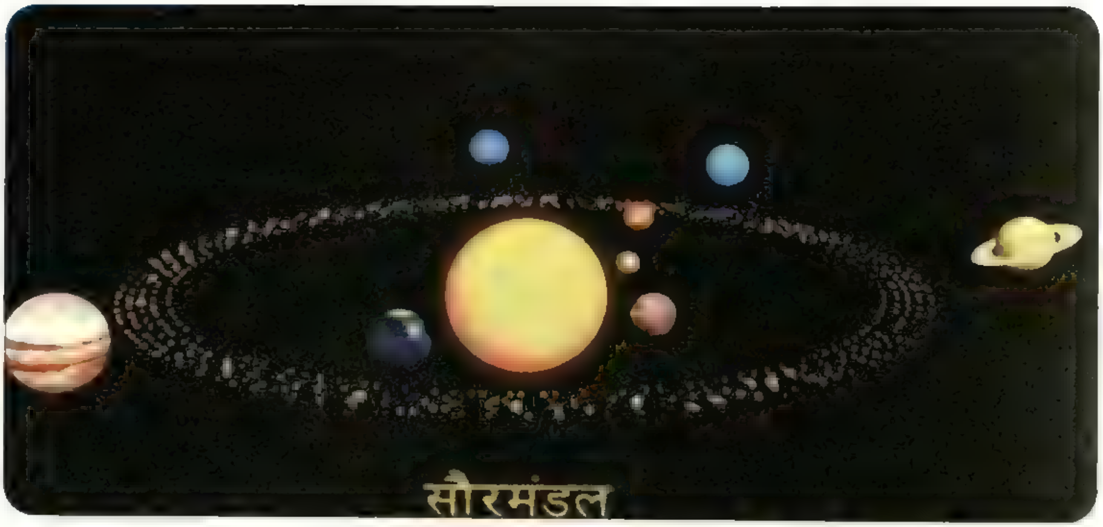

वृक्क
(Kidney)
वृक्क की संरचना
(Structure of Kidney)
वृक्क नलिकाएं
(Nephrons)
धमनिका
(Arteriole)
कोशिका गुच्छ
(Glomerulus)
यूरिया
(Urea)
सोडियम आयन्स
(Sodium Ions)
अन्य अपशिष्ट पदार्थ
(other waste)
जल
(Water)

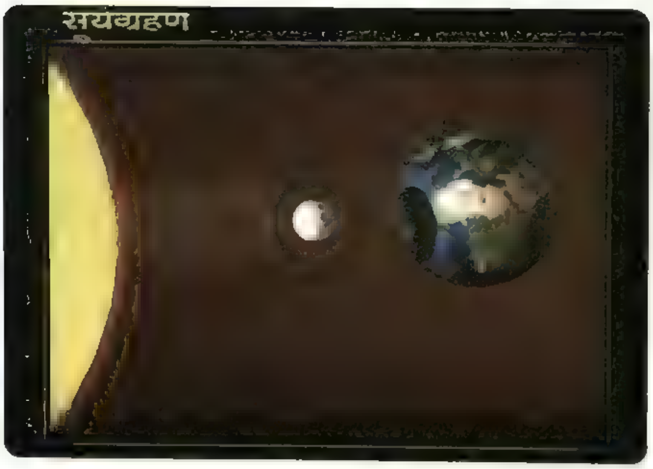
script writer must ensure a meaningful break up of a lesson into units in such a way that reak up helps in retaining the child's interest and ensures that this does not flag. Further, ost priority should be given for a meaningful break up that is child friendly. Topics and ng objectives should be listed in a graded manner such that teaching shall move from e to complex.

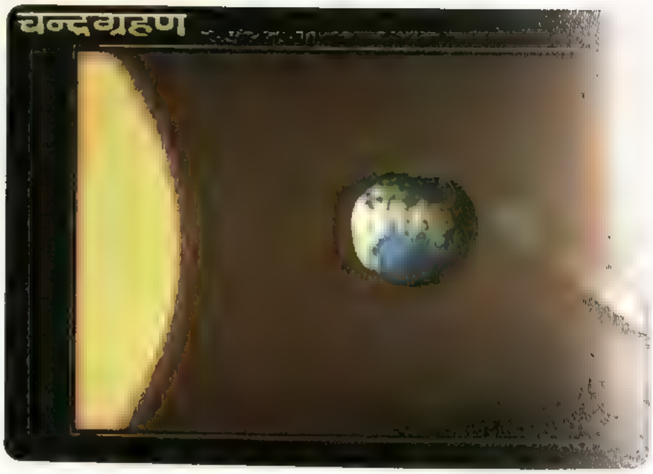

बृहत धमाका
(Big Bang)
दुग्ध मेखला गैलेक्सी तथा अन्य गैलेक्सियाँ


100 000
LIGHT YEARS
NUCLEUS
APPROX POSITION
OF SUN
CENTRAL BULGE


100 000
LIGHT
YEARS
SUN
DUST
NUCLEUS
3000 LIGHT
YEARS
GALACTIC
BULGE







Science - Class VI

Since the optimum attention span of a small child is 3-4 minutes, information must be presented only for 3-4 minutes at a time, after which the teacher needs to step in to monitor understanding and clear doubts.

[illegible]

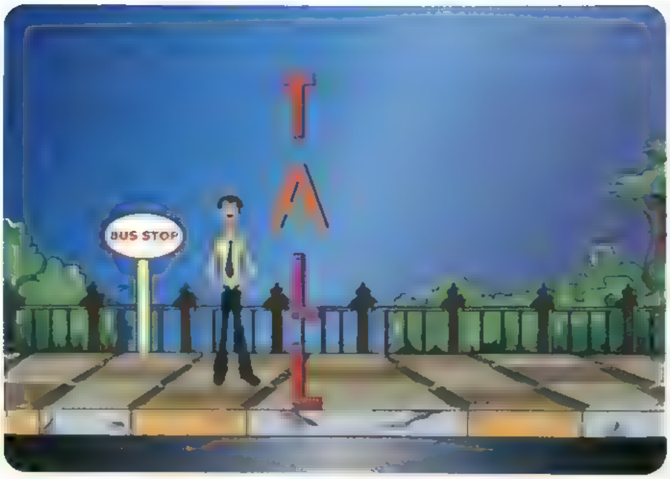
It [illegible] id that repetition is the “mother of all learning.”

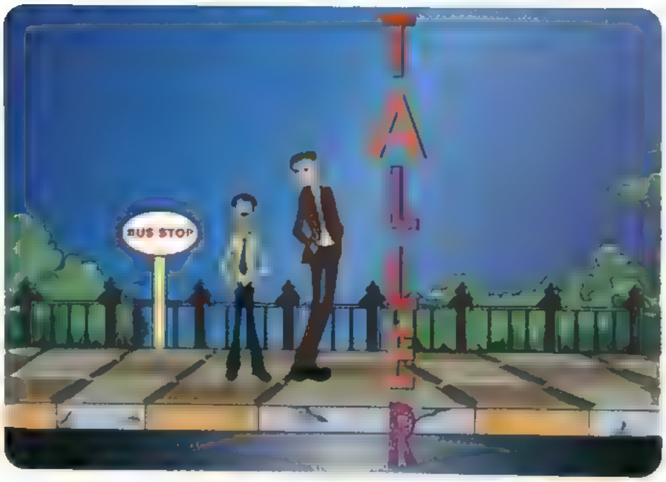
T [illegible] may be two types of repetitions :
Repetition of the concept within the same chapter.
Repetition of the entire chapter.

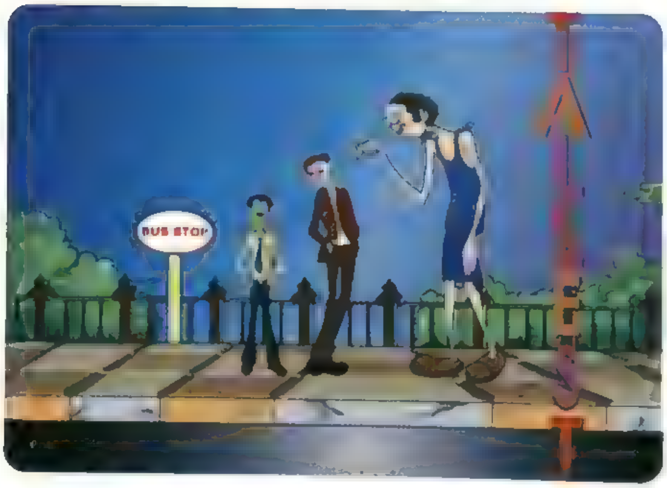
[illegible]

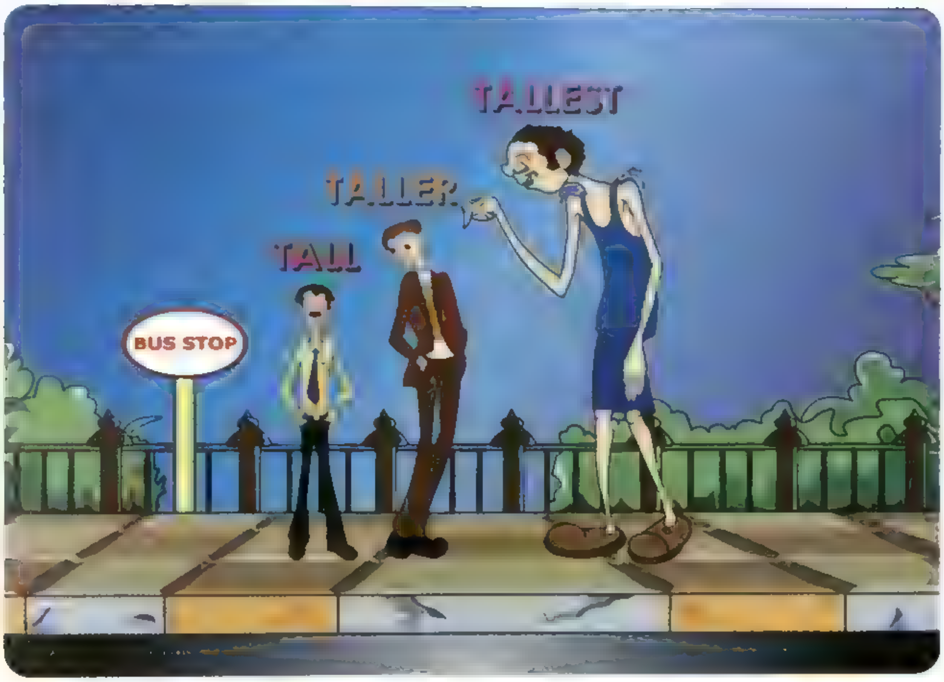
A [illegible] h the number of repetitions required varies from person to person and topic to topic. T [illegible] rage person needs at least 15 repetitions of the same thing to begin to store it into long t [illegible] mory. Repetition on the one hand should be inbuilt into the chapter. Care however has t [illegible] ken to see that the repetition does not become monotonous and boring. An average c [illegible] should contain:

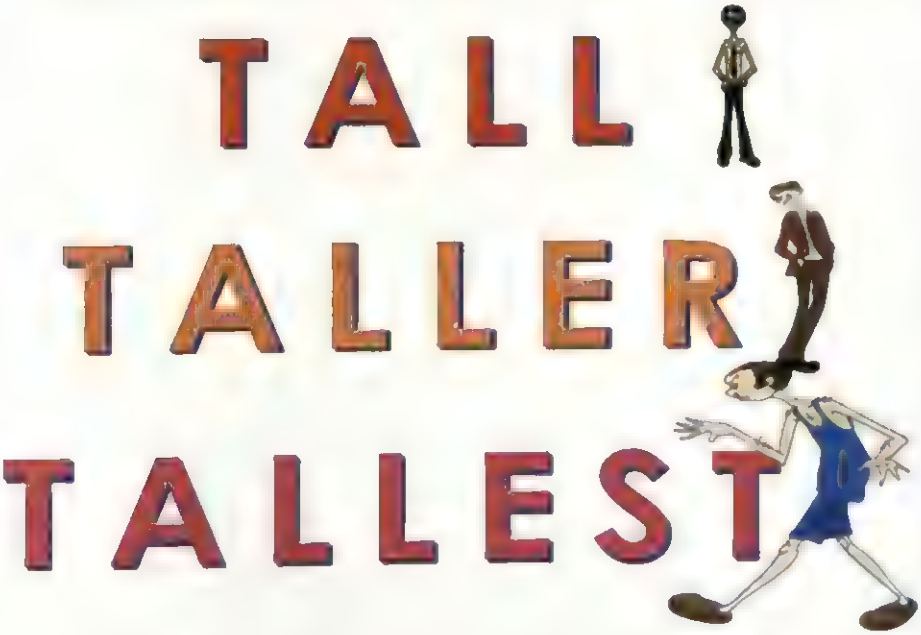
- [illegible] he content first, in audio visual medium.
- [illegible] summary of the topic in text, for children to note down.
- [illegible] iagrams, if any.
- [illegible] uestions and Answers of all types.
- [illegible] ongs summarizing the concept.
- [illegible] hildren should also be encouraged to do some homework based upon the chapter that was taught, with the help of their textbooks.
- This will ensure that there are at least six repetitions on the same day of teaching.
- The script writer must ensure the repetition of the textual material at least thrice. This will ensure that whatever was taught in the class is imprinted in the minds of the children.
- It is the discretion of the script writer how to go about emphasising the main points and concepts.


BUS STOP
TALL


BUS STOP
TALLER


BUS STOP
TALLEST


TALLEST
TALLER
TALL
BUS STOP


TALL
TALLER
TALLEST

The members of the Task Force appreciated the way of teaching 'degrees of comparison' and repetition of the same. They suggested that the same model should be followed in every lesson across different subjects.

Repetition of the entire chapter.

- Psychologists prescribe that if the speed of learning is to be maximized at a steady % recall rate, then the first review of the material should be held within 3-7 days ne chapter/lesson first being taught. Some complex pieces may need to be reviewed the y next day.

Repetition of songs

- Songs should be repeated at regular intervals whenever there is some leisure time. n audio cassettes/CDs of the songs can be provided to the children so that they can lis o it on their own.

Sequence of teaching by means of CAL and by textbook

- As per the general philosophy of pedagogy of introducing the simpler concept follow y the abstract, the easier to understand and concrete CAL should be shown first e children followed by the teaching from the textbook.

The breaking up of chapte

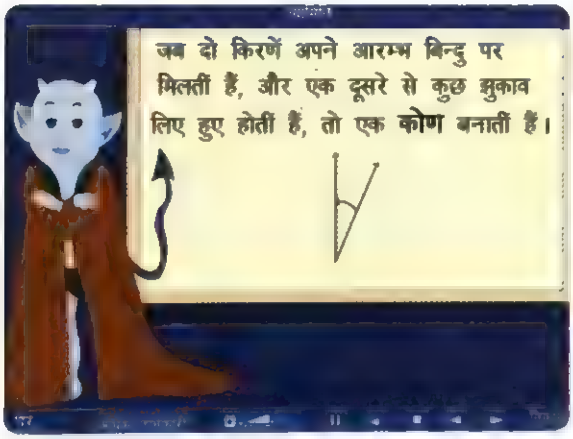
- According to researchers, the optimum attention span of a child is 3-4 minutes e chapter therefore, has to be broken into units of 3-4 minutes each. However, aft 4 minutes, the teacher should take over and ask a few questions to monitor learning. e children have understood, s/he can move to the next unit of the chapter. If some chi n have not understood s/he could explain the concept before replaying the previous t. This way, the CAL can be shown for one period of 35 minutes, or even upto one hou a stretch, but ideally not longer than this.

LANGUAGE

- Language plays an important role in the teaching-learning process.
- The subject expert must use a simple, effective and child friendly language so that the understanding of the child is increased.

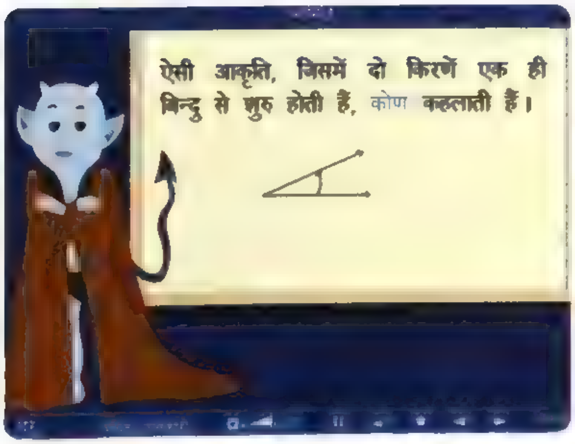
The following suggestions were made for the effective use of language:-

[illegible]



जब दो किरणें अपने आरम्भ बिन्दु पर मिलतीं हैं, और एक दूसरे से कुछ झुकाव लिए हुए होतीं हैं, तो एक **कोण** बनातीं हैं।

Before review

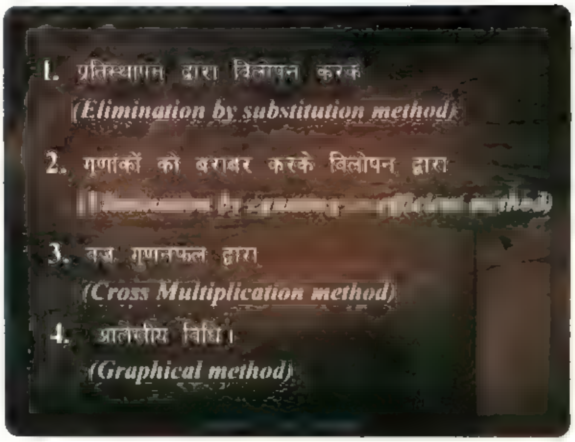


ऐसी आकृति, जिसमें दो किरणें एक ही बिन्दु से शुरु होती हैं, कोण कहलाती हैं।

After review

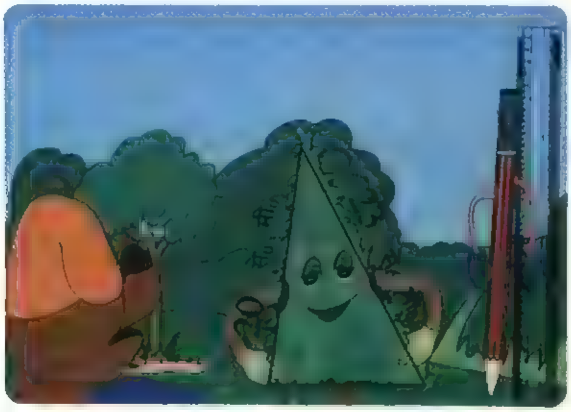
In the above visual that was changed after the review, the definition has been reduced to a much simpler, shorter and to a spoken and child friendly language.

Bilingual texts should be used as shown under:



1. प्रतिस्थापन द्वारा विलोपन करके
(Elimination by substitution method)
2. गुणांकों को बराबर करके विलोपन द्वारा
([illegible] by [illegible] method)
3. वज्र गुणनफल द्वारा
(Cross Multiplication method)
4. आलेखीय विधि।
(Graphical method)

The script writer must ensure that every effort has been made to simplify the [illegible]



देखिए मेरी भुजाएँ आप
सब का अलग है माप
इसीलिए तो जानिए जनाब
विषमबाहु त्रिभुज है मेरा नाम।

Care has been taken to ensure that:

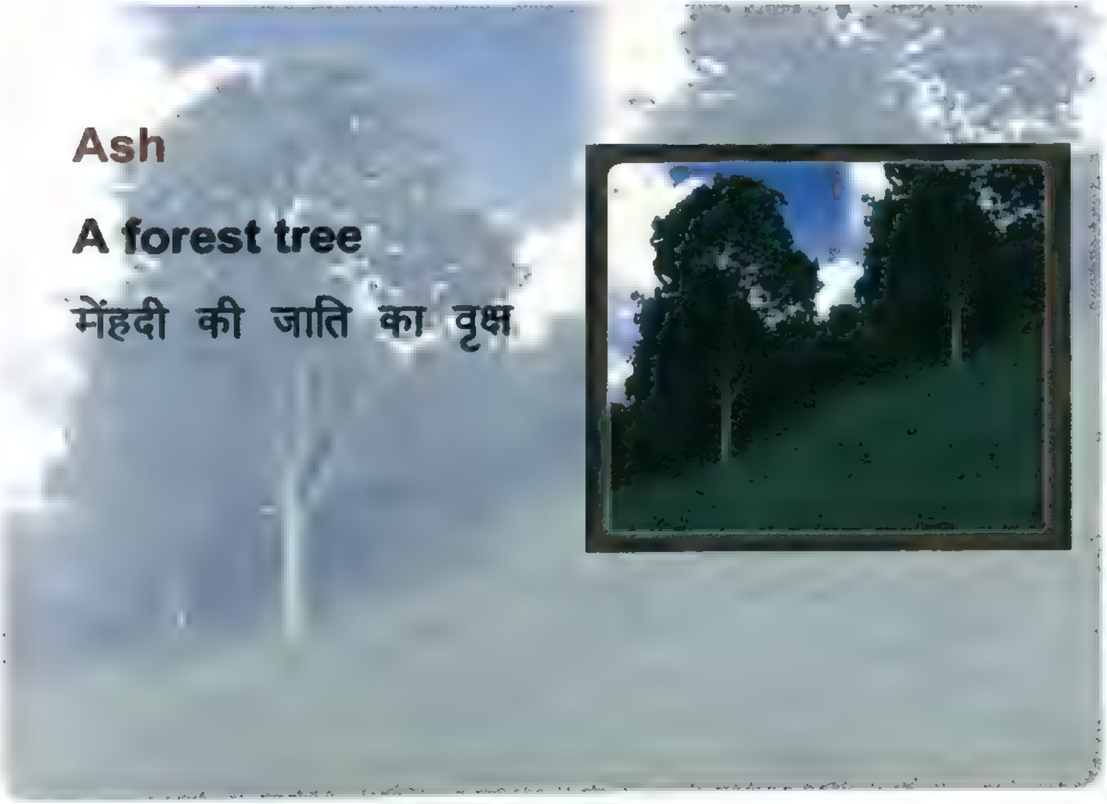
- The language used to teach is simple, interesting and such that the child can form 'associations' with the concept taught. This will help him/ her 'recall' faster.
- Spoken language has been used in a small Jingle written below to teach 'विषमबाहु त्रिभुज'

A conscious effort should be made to avoid the use of abstract words.

- Members of the Task Force suggested that script writers must avoid the use of abstract words and should try to use words which have related meanings.
- Slang words must be avoided.
- Words which give any unintended negative values must also be checked and they should not be a part of the script.
- Words must have a clear meaning and their use should be at the appropriate places, so that the beauty of the language is appreciated by the learner.

DIFFICULT WORDS

- It was decided that all important words should be supported by visuals. Difficult words should be explained citing different examples.
- Difficult words may be explained and clarified by using related visuals.
- This will help the student in registering and remembering such words with no extra effort. In other words, proper illustrations/examples should be given for technical terms before defining them.
- It was also decided that in the absence of visuals, every possible effort should be made to make difficult words understandable and clearer in every aspect.



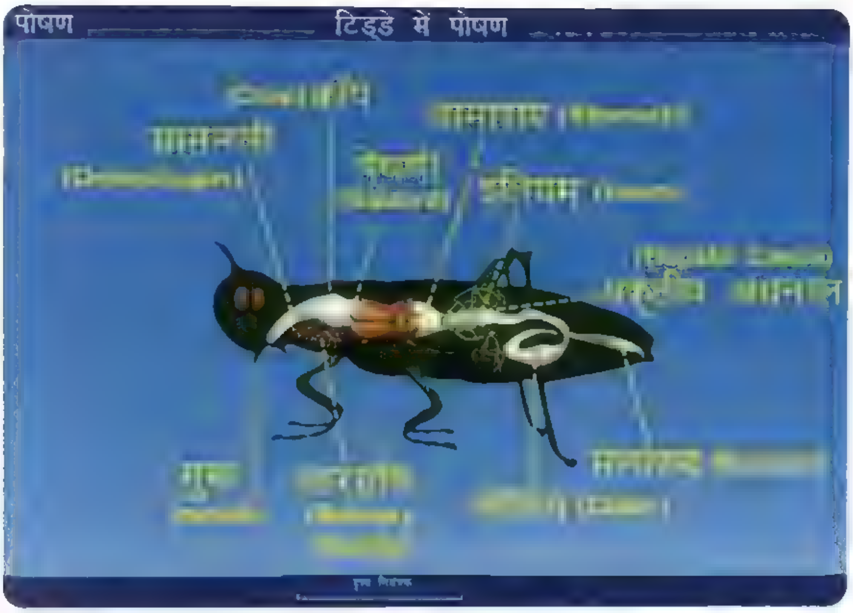
Ash

A forest tree

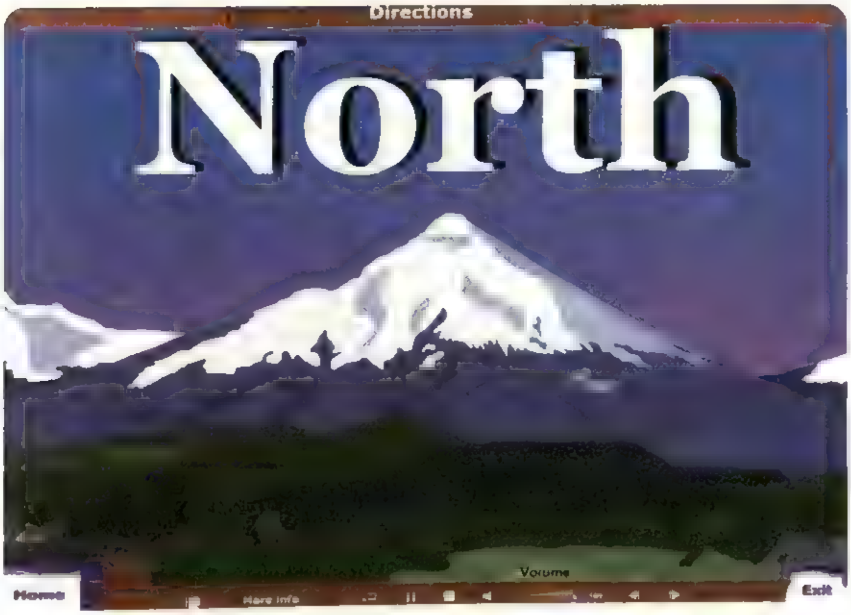
मेंहदी की जाति का वृक्ष

USE OF SCREEN SPACE

1. An optimum use of the screen space was favoured by the Task Force which stresse at the appearance of blank spaces on the screen should be avoided as far as possible.
2. It was also observed that there should not be more than 5-6 lines of text, in a big fon e, on the screen at any point of time. This would enable better and clearer reading e students.
3. The use of screen space should be supportive of the text and continuity of movem of characters should be maintained.
4. Spaces and time frame of a particular scene on the screen should be thought of car y keeping in mind the need of the learner.
5. Irrelevant characters and other things which do not convey any relevant informat n the topic or text should be avoided.
6. The presence of too many objects in one scene will confuse the learner and interfe h proper understanding of the concept and topics as well. The proper ratio be n animated characters and text should be maintained.
7. The links given on the screen should be self explanatory.
8. Technical details of "Filming" like zoom, cut etc. should be kept in mind and e purposefully.
9. The change from one scene to another and the change between screens should h e from jerks. The change of scenes should be smooth so that it does not distra e attention/concentration of the viewer.


पोषण
टिड्डे में पोषण
ग्रासनली
गुदा

Science Class-X


Directions
North
Home
More info
Volume
Exit

English - Class VI

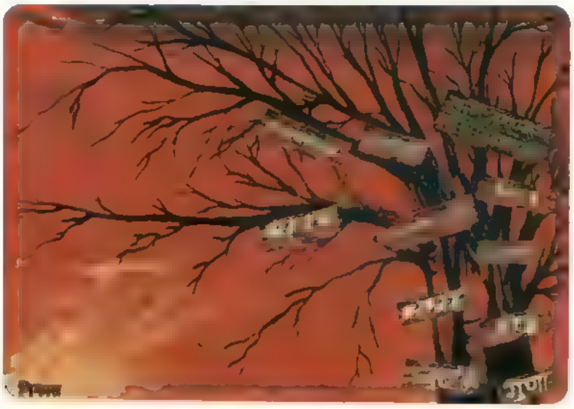
In the above visuals, the screen space has been used effectively. It can also be noted that the options of 'replay', 'pause', 'next' and 'more information', have been given to the teacher providing him/ her the flexibility to move at his/ her desired pace.

USE OF COLOURS

On the technical side, some suggestions were made regarding the use of colours:-

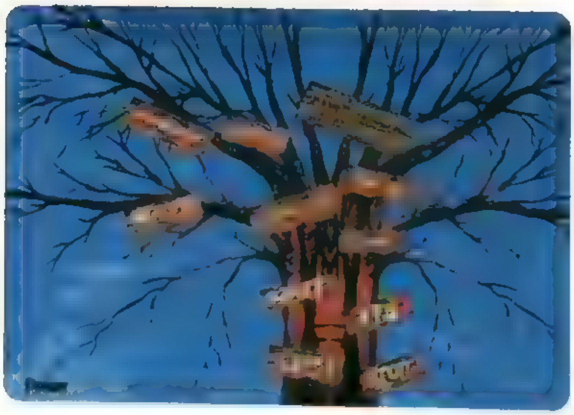
Use of hot colours should be reduced while creating animations

Figure (i)



Before review

Figure (ii)

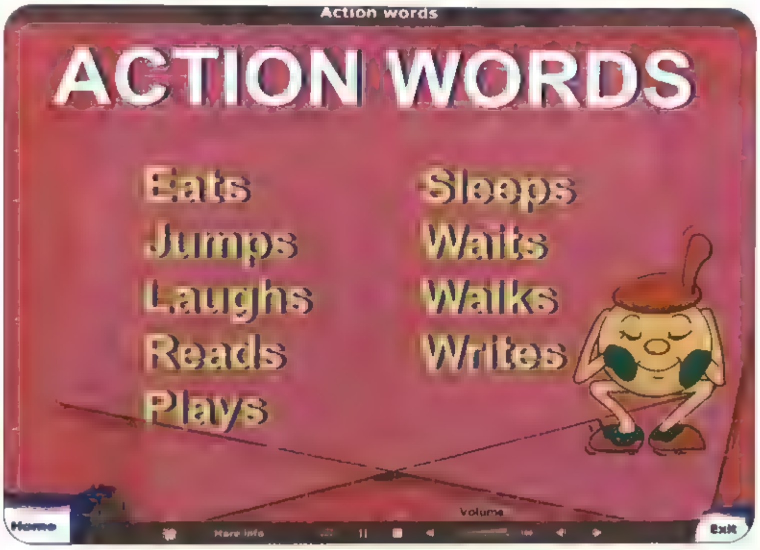


After review

In Figure (ii) the following can be observed:

- Optimum use of screen space
- Proper font size has been used
- Soft and child friendly colours replace the hot colours

[illegible] to screen design: Screen design should be pleasant and the learning objective should be clear.



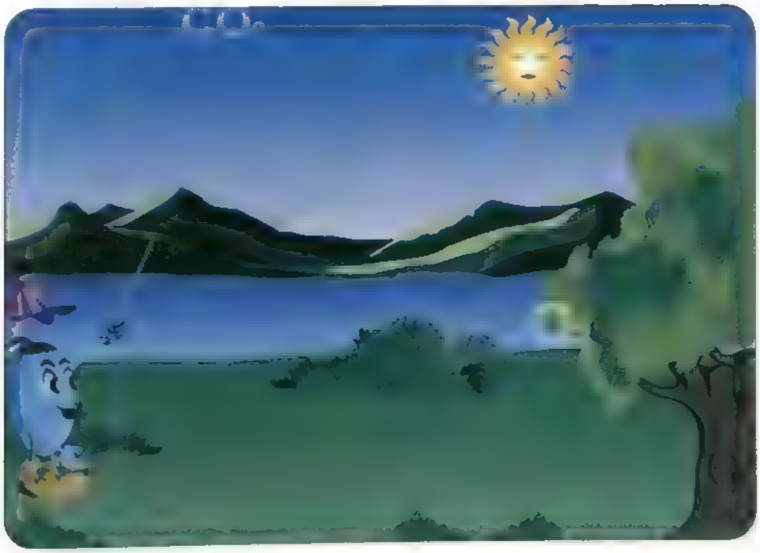
Action words

ACTION WORDS

Eats
Jumps
Laughs
Reads
Plays

Sleeps
Waits
Walks
Writes

[illegible] and soothing colours should be used



Science Class VI

Members of the Task Force suggested that the colours on screen should be able to establish a relationship between the students and the teaching material so that the learning process can be improved and the same may have a lasting impression.

The use of colours should be such as to get the children thinking and [illegible] to should have a permanent impact on the mind of the child.

The use of effective colour schemes on the screen will automatically attract the child towards the learning material and s/he will develop an interest in the topic.

Figure (i)

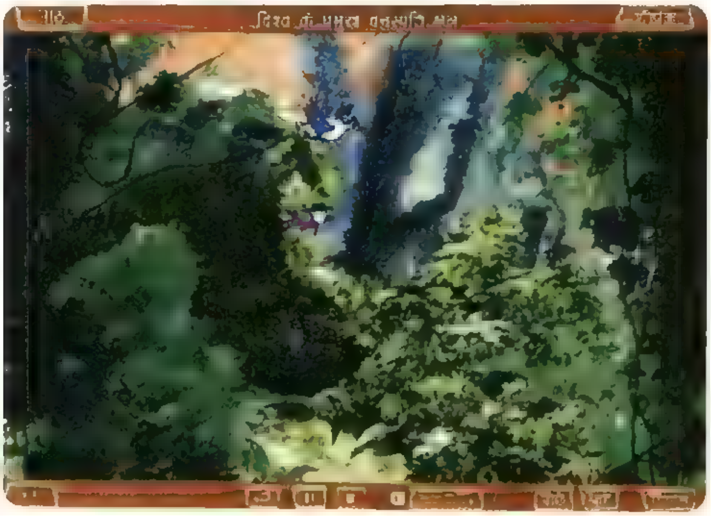
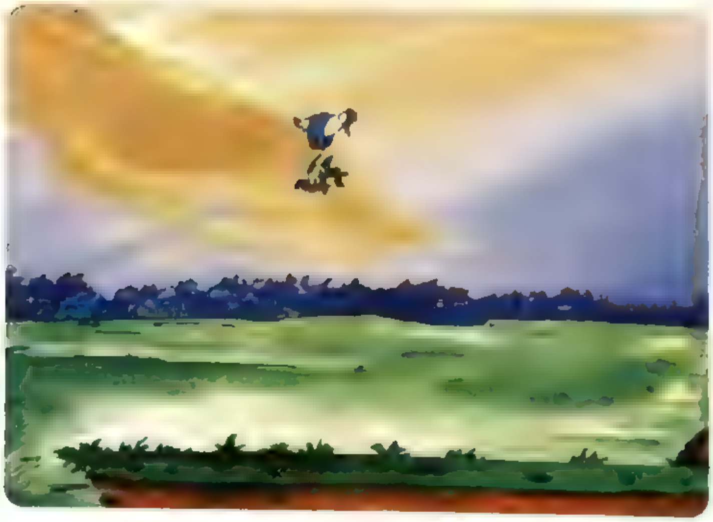


Figure (ii)



Social Science Class VI

In the above visuals, the birds are shown flying over two different places in Figure (i) over the jungle and in Figure (ii) over lovely meadows.

Here, an attempt has been made to clearly distinguish both places by the effective use of colours to capture the student's interest.

UND

- d is the most important tool that is used to communicate the required information to the target ence.
- ds and Voice-over give life to the characters that are created by the animators.
- ecessary to ensure the best use of this tool to transform knowledge effectively.
- uate planning and attention should be given while recording the sound for the programmes.
- uld be the primary responsibility of the team concerned to ensure that no words of the text present in cript are missing while recording the sound.
- hild absorbs and reproduces the words as she hears them and the child tries to pronounce the word in ame manner as it is presented to her. So it is absolutely important to ensure proper pronunciation of ls.
- peed at which the script is spoken should be decided keeping in mind the needs of the students.
- ne should not appear to be talking down to the students. Children do not react well or positively to a tone. Hence

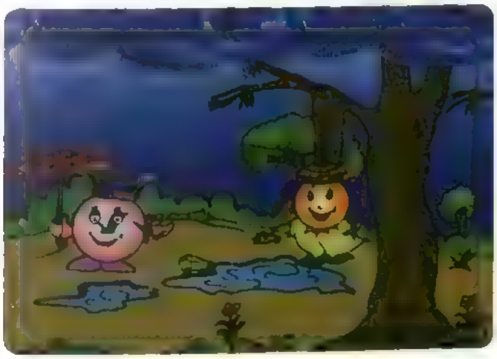
unds should be friendly, clear and something that children can relate to. The speed of the sound hould be set as per the need of the students.

e skill of differentiating the pronunciation of words through voice-over should be imparted, so that

US F TEXTUAL MATERIAL

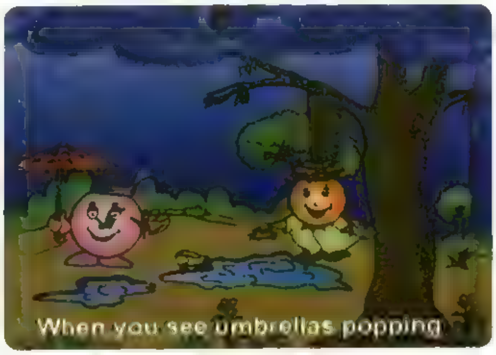
It ggested that the textual material should be minimized to the extent possible and that te erial should not in any case be more than 25% of the screen space. Further, the use of tex upport sound was favoured

Figure(i)



Before review

Figure(ii)

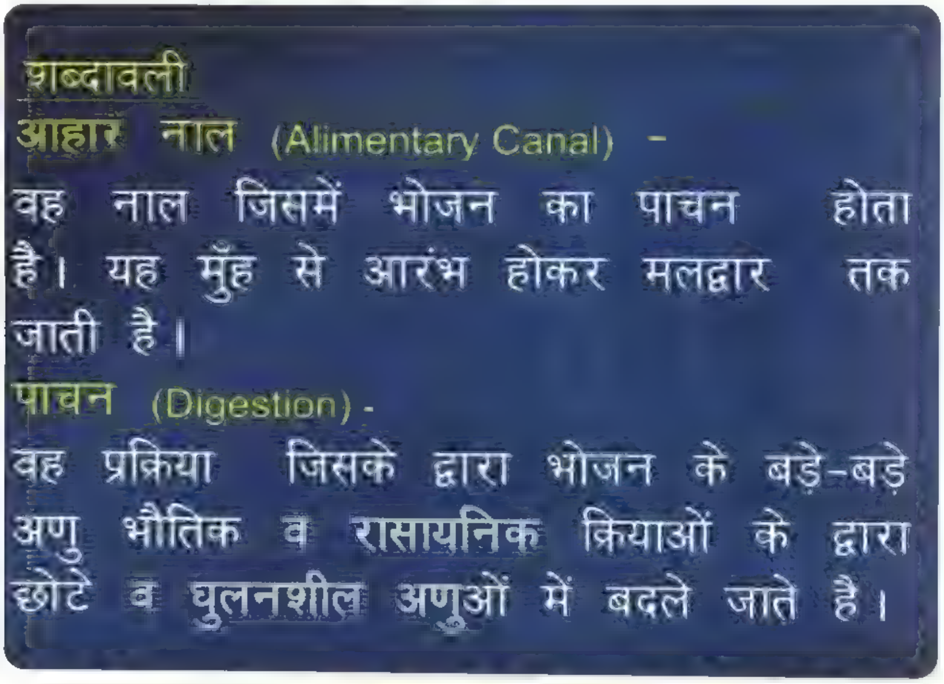


After review

English Class VI

All the songs used in the content should be supported by text on screen as shown in Figure(ii). This helps children to understand and follow the lyrics clearly, thereby helping them to sing along correctly.

Class VI & X Science It was suggested that all the technical terms given in Hindi should also be given in English Flashing of important texts was considered to be very important to emphasise the words and concepts.



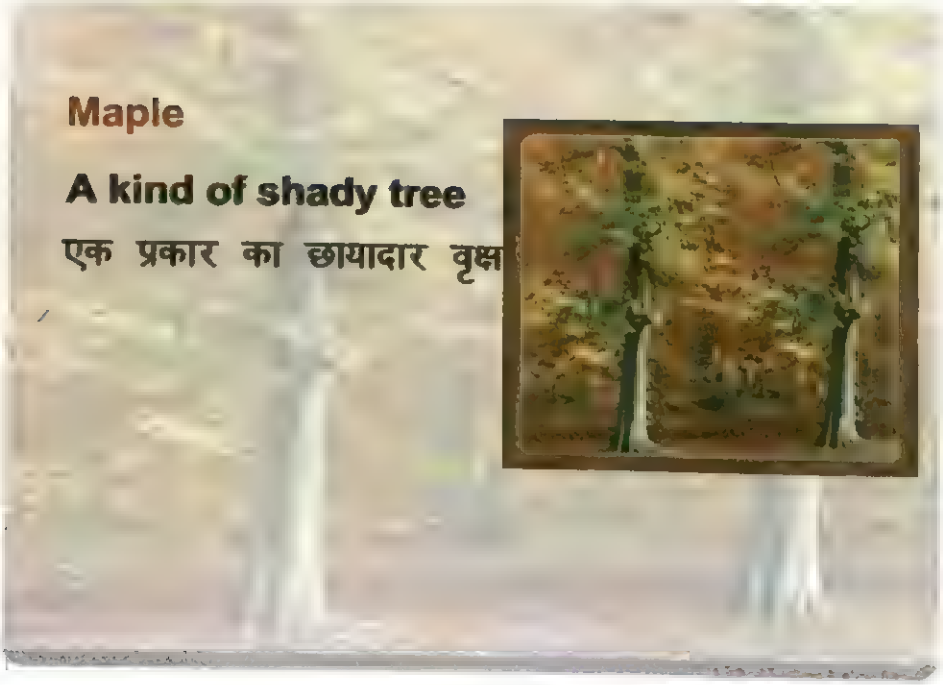
शब्दावली

आहार नाल (Alimentary Canal) -

वह नाल जिसमें भोजन का पाचन होता है। यह मुँह से आरंभ होकर मलद्वार तक जाती है।

पाचन (Digestion) -

वह प्रक्रिया जिसके द्वारा भोजन के बड़े-बड़े अणु भौतिक व रासायनिक क्रियाओं के द्वारा छोटे व घुलनशील अणुओं में बदले जाते है।



Maple

A kind of shady tree

एक प्रकार का छायादार वृक्ष

INSTRUCTIONS FOR TEACHERS

- r effective implementation of CALtoonZ, it is very important that the teachers use this ol to its maximum potential.
- was suggested that as this is a new teaching-learning aid in the classroom for the chers, guidance be provided to them for its optimum usage.
- structions can be woven into the lessons as indications and this could include pointers like:
  - How to use, what to use and what should be the method of using the content in the classroom.
  - Relevant information to enable the teachers to use this programme more efficiently.

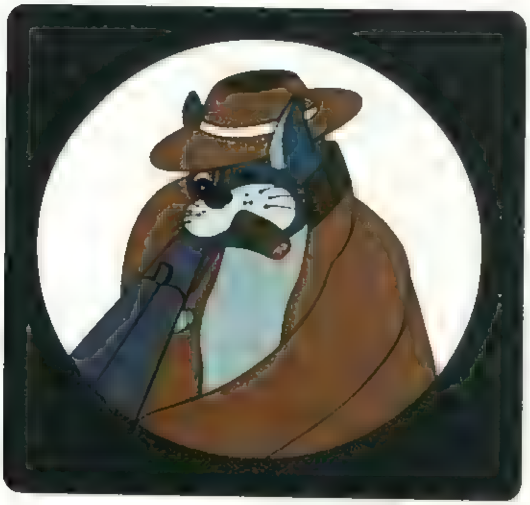
s context, it was suggested that a separate manual be printed for the teachers with at one model presentation or better still a separate link in the CD itself be developed so he teachers are able to use this programme more effectively and uniformly.

VALUES

Utmost care should be taken to ensure that no intended or unintended negative va[illegible] are passed on through the content. This includes a wide spectrum of things like dialogues, [illegible]s of characters, presentation of characters, scenes of violence, scenes of smoking, [illegible] of environmental abuse, gender injustice or any other visuals with any negative aspect/im[illegible].

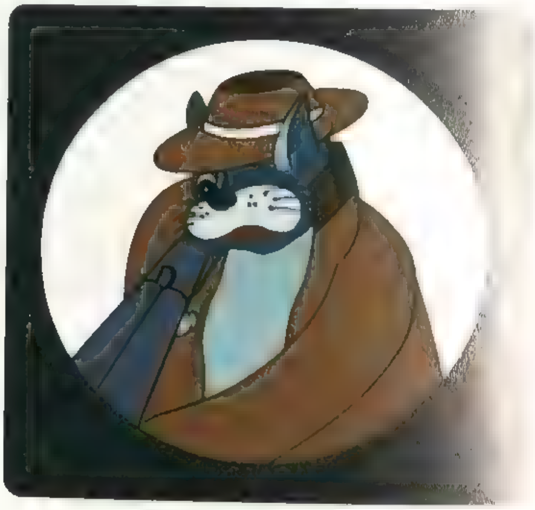
In the same vein, efforts should be made to impart positive values which should be wov[illegible] the context matter itself. Situations from everyday life can be taken and presented to str[illegible]ood values. However, when SAEP modules are prepared on HIV/AIDS, Smoking and Alcoh[illegible] are must be taken to depict the negative images using the correct methodology.

Figure(i)



Before Review

Figure(ii)



After Review

English Class VI

Earlier, Felio was shown with a cigar in his mouth in the chapter 'Prepositions'. In the new visual, the cigar has been removed.

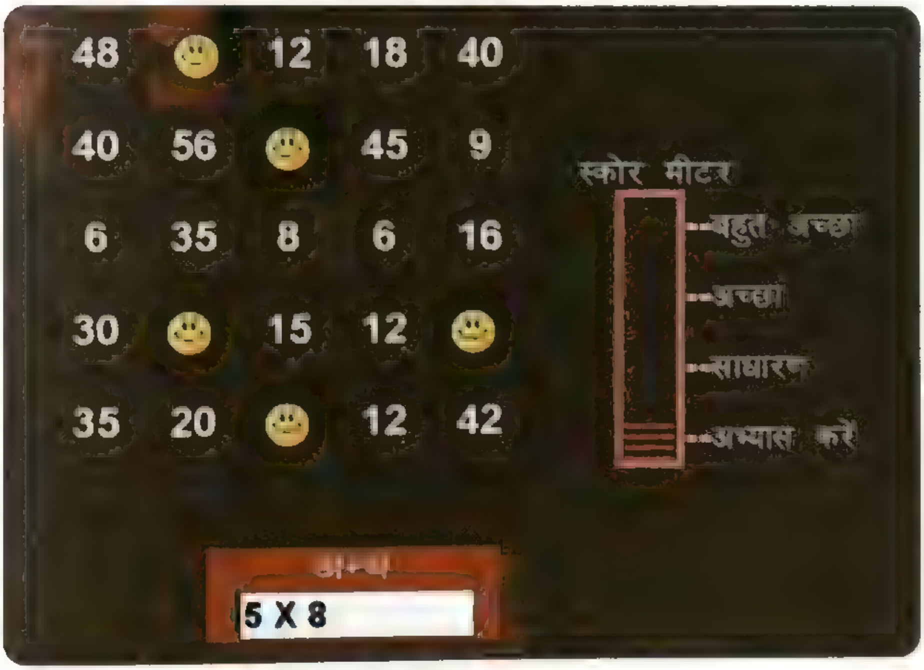
Gender sensitization

Multimedia content is an especially effective tool to counter gender biases and break stereotypes. It is important to avoid subtle gender biases in images, words and concepts. Both genders must be equally represented in all lessons and in all roles. For example, both males and females as Executives, Home makers, Doctors, Nurses, Teachers, Bus Drivers etc. must be shown. In sound recordings both male and female voices should be used. In language while Hindi pronouns are gender neutral, masculine and feminine, pronouns must be used equally in English. Also special caution must be exercised where masculine gender is the default gender.

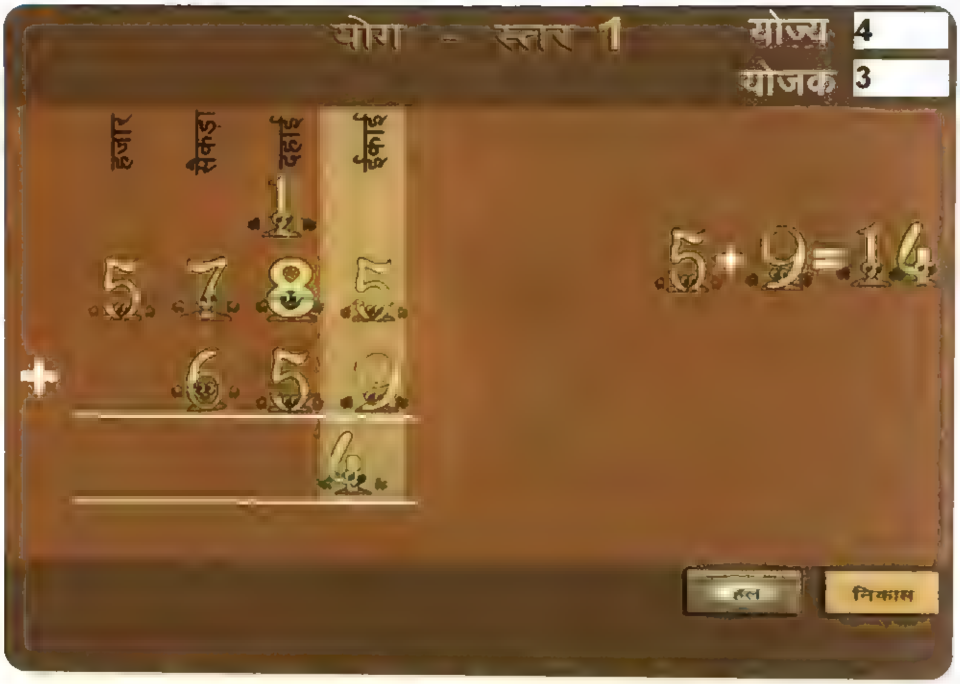
INTERACTIVE MODELS

- [illegible] felt that the exercises and games used as a part of the lesson/topic, though very good, [illegible] not enough and were not used in all the topics.
- [illegible] certain chapters are supported by interactive games and exercises.
- [illegible] is a very important tool to recall concepts, it was strongly suggested that more such [illegible]ative exercises and games be included both to facilitate reiteration of concepts as well [illegible] make learning more joyful and interactive.

अधिक से अधिक मुस्कान इकट्ठा करें

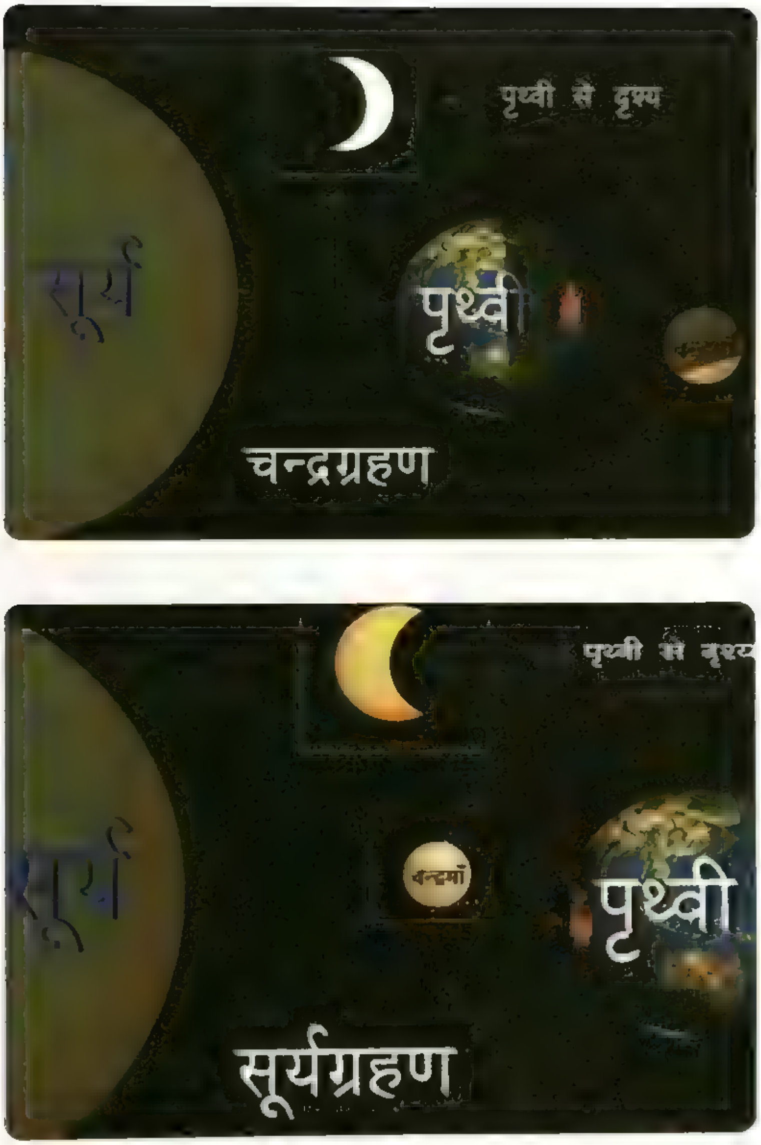

48
12
18
40
40
56
45
9
6
35
8
6
16
30
15
12
35
20
12
42
स्कोर मीटर
बहुत अच्छा
अच्छा
साधारण
अभ्यास करें
5 X 8

Maths - Class VI



Maths Class VI

- Games have been used in the lessons to teach addition, subtraction, multiplicat nd division.
- Innovative exercises and games which could generate an infinite num of questions/problems have been used.
- It was also kept in mind that the games and exercises should be interactive a ey must arouse the interest of the students in the teaching learning process he classroom.
- It was also felt that a set of well thought out games and exercises would also result an increase in the participation level of the learners.

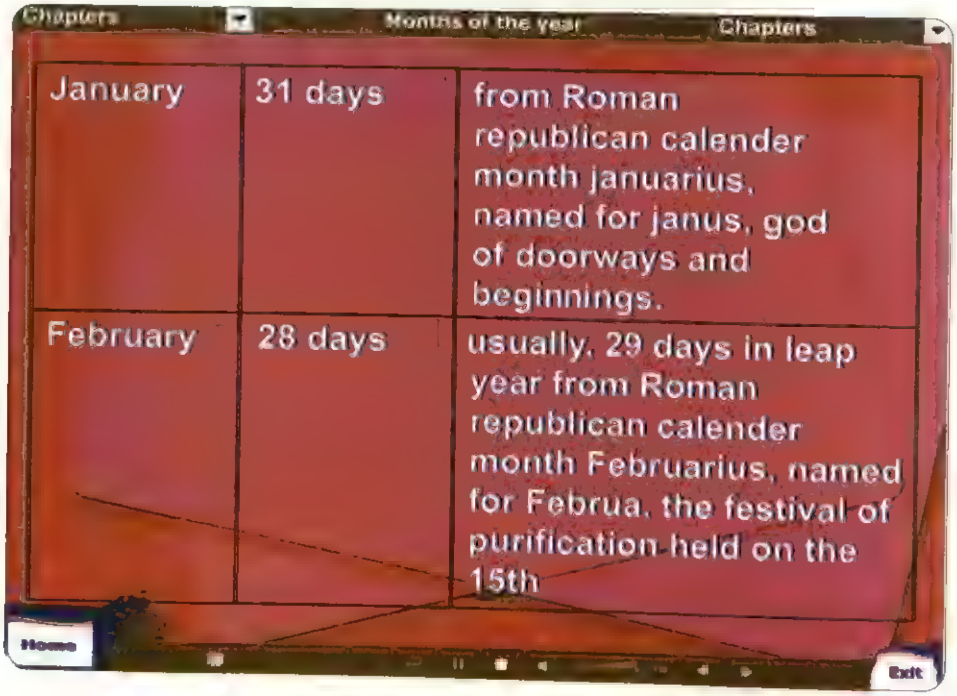

पृथ्वी से दृश्य
सूर्य
पृथ्वी
चन्द्रग्रहण
पृथ्वी से दृश्य
सूर्य
चन्द्रमा
पृथ्वी
सूर्यग्रहण

Science Class X

The interactive models have already been introduced, so that the teaching-learning process becomes interesting and child centered. In the above visuals, the students can easily grasp the process of solar and lunar eclipses instantly without any difficulty.

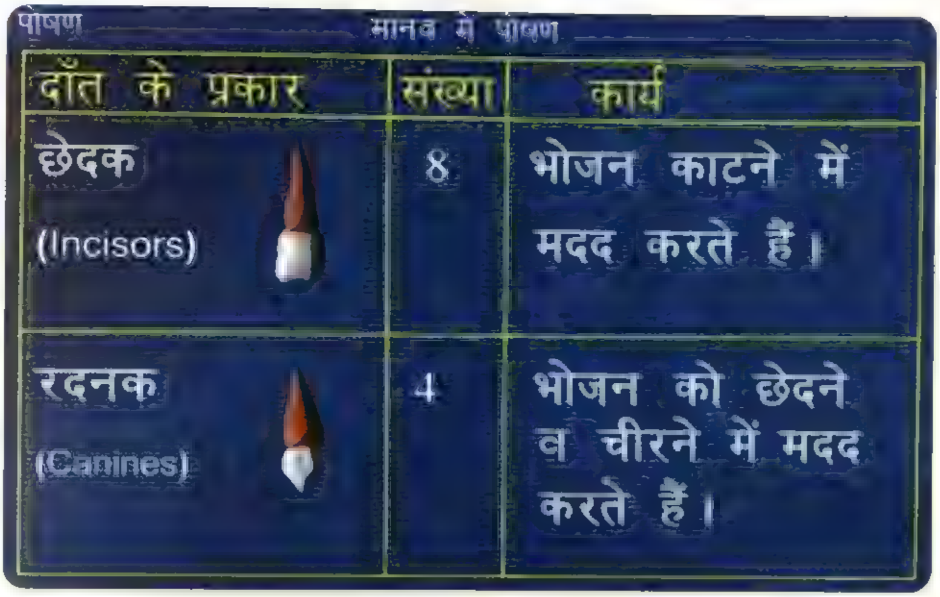
EXTRA INFORMATION

- Attempts should be made to give interesting facts and relevant information under this caption. Top priority should be given to the fact that the knowledge given through this link should be interesting, joyful, meaningful, relevant, and most important, correct.
- It was suggested to explore the possibility of presenting the 'More Info' text in an interactive form.
- Further caution should be exercised to ensure that 'More Info' does not end up looking like an e-book.
- It was also felt that every information given in this link must be purposeful, and no advanced or higher information which may not be relevant to the students at this stage be given through 'More Info'.
- It might distract or confuse the child if complex facts or definitions are presented to her which are not necessary to be provided at this level. 'More Info' that is not relevant to the target audience and complex definitions should be deleted. There is no need to give such information as it will confuse the students.



January	31 days	from Roman republican calender month januarius, named for janus, god of doorways and beginnings.
February	28 days	usually, 29 days in leap year from Roman republican calender month Februarius, named for Februa, the festival of purification held on the 15th

Class VI English

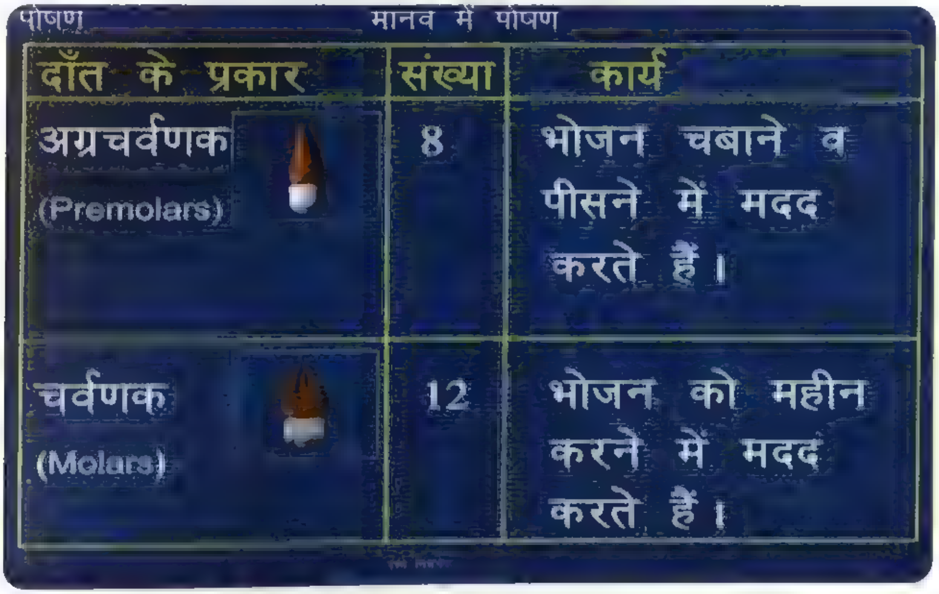


पोषण

मानव में पोषण

दाँत के प्रकार	संख्या	कार्य
छेदक (Incisors)	8	भोजन काटने में मदद करते हैं।
रदनक (Canines)	4	भोजन को छेदने व चीरने में मदद करते हैं।

Science Class-X



पोषण

मानव में पोषण

दाँत के प्रकार	संख्या	कार्य
अग्रचर्वणक (Premolars)	8	भोजन चबाने व पीसने में मदद करते हैं।
चर्वणक (Molars)	12	भोजन को महीन करने में मदद करते हैं।

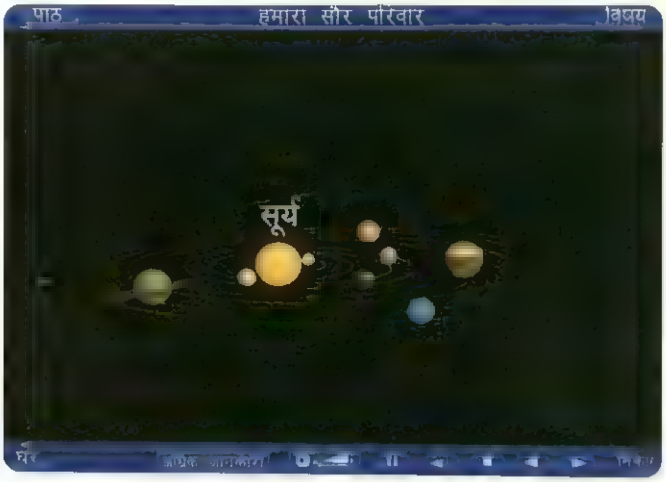
Science Class-X

VISUALS/CAPTIONS

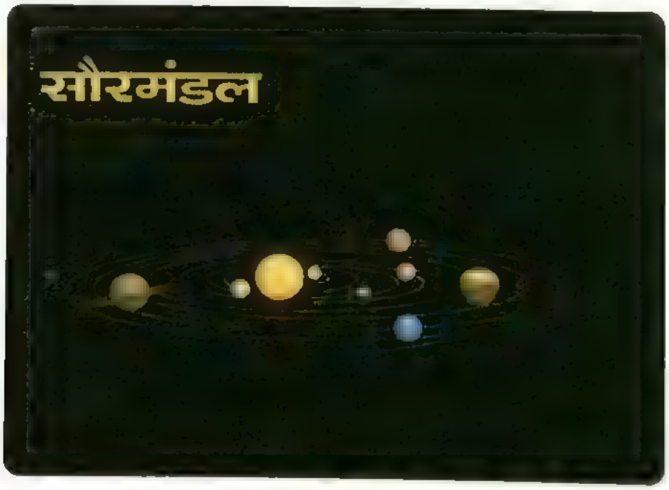
The captions that are given in the lessons or the labeling should be super-imposed where required and at adequate places. This will enable children to learn them without any confusion.

In Science diagrams, it was suggested that the visuals be given in relation to the whole body.

Example: The location of the planets should be given in relation to the whole solar system and not in isolation. Even when it is to be explained in isolation, the visuals should simultaneously show their position in the whole system.



Further, the pattern of information with regard to similar objects must be the same wherever and whenever they are presented, for example the Solar System.



Science - Class X

SUMMARY OF REVIEW RECOMMENDATIONS

PRESENTATION OF ANIMATIONS

The Task Force recommended the following points with reference to the use of camera/presentation of the animation:-

- Unnecessary camera zooming should be avoided as it disturbs the visuals.
- The titles should be animated and must not be distracting.
- Sound must be aptly supported by the lip movements to give realistic images.
- Writing and voice over should match word by word.
- Intensity (pitch) of sound must be uniform and audible.
- Visuals' 'stay time' on screen should be increased to register their presence.
- There must be synchronization between visuals and sound.
- The shift or the change must be systematic and there should be no blurring during the change of scenes.
- Examples must be given along with visuals.
- The whole screen should be used, not leaving any blank spaces.
- Jerks should be removed from clips.
- Movement of characters and vehicles must be uni-directional. The scene of the direction must be followed in the animation to avoid confusion to the students.
- The scenes must be realistic and logical.
- Visuals must register their presence by their movements.
- Attempts should be made to use the same (uniform) format in every lesson.
- 'Click option' should be given so that the students can effectively use the programme.
- Purposeful use of filming like zoom, cut etc. should be adapted.

GUIDELINES FOR CONTENT

Suggestions were also made as to how a lesson can be meaningfully structured and presented for better understanding and grasping of contents. Some of the recommendations made for effective implementation of the above, are listed as under:-

1. Characters should be taken and named from every religion and should also be representative of the different ability groups of society.
2. Simple and behavioural language should be used.
3. For making learning thought-provoking, problems with open-ended solutions or open ended questions should be included.
4. It should be ensured that no intended or unintended text messages or gestures of violence, abuse etc. are passed on through the content.
5. High importance to be attached to repetition of the content to enable high recall of concepts.
6. 'Instructions to teacher' to be definitely included as a part of the lesson itself to ensure effective implementation.
7. Different steps for effective structuring of lessons to be strictly followed.
8. Adequate attention to be paid while sound is recorded.
9. Pronunciation of different words to be differentiated through voice-over.
10. The voice used should not sound as if it is talking down to the children. It should be friendly and something the children can relate to. Speed of the voice - over should depend upon the need of the target audience.
11. Texts of songs to be given in all chapters and important words should be flashed for better understanding of vocabulary.
12. Captions to be super-imposed at the correct places.
13. The different technical aspects as to the presentation of the animations/content (eg. reduce use of hard colours, camera zooming issues, movements of characters, effective usage of screen space etc.) should be understood and strictly followed.
14. While teaching, context should be related to concept, extensively using real life examples to explain situations.
15. Important related knowledge, even if it extends beyond the syllabus, should be provided to the children.
16. Attempt to establish a link between the concepts, behavioural knowledge and experiences of the children should be made.
17. For Secondary Class (X Class), a more descriptive text is to be incorporated.
18. Question-Answers to be based on CBSE pattern, giving value points. In answer, the text which carries the value should be highlighted.
19. Care should be exercised while explaining difficult technical terms by giving illustrations, preferably from every day life, and then defining it.
20. Sequential summary of lesson is very essential to recapitulate what was taught.

CHECK LIST FOR REVIEWING CONTENT

1. List of concepts to be given
2. Sequencing of concepts should be appropriate
3. List of topics to be given
4. List of sub-topics to be given
5. Choice of characters from surroundings
6. Choice of character from all communities
7. Use of spoken language
8. Optimum screen usage
9. Context relevant to concept
10. No unintended values delivered
11. More than two examples used for one sub-topic
12. Not more than 5 lines of text on one screen
13. Bigger font size
14. Teacher's instructions must be clearly given
15. Appropriate drill of all topics
16. Question-Answer on CBSE pattern
17. Value points in questions marked
18. Logic given in question answer
19. Additional information should be interesting & not from course book
20. Time limit of one module is max. 20 min.
21. Each module is complete in all respects
22. Song at the end of each lesson
23. Song at the end of topic (unit) , summarizing concept
24. Introduction of topic (unit)
25. Introduction of module
26. Diagram/Map wherever required
27. Black outline for diagrams

FROM A PROCESS-DRIVEN APPROACH TO A PRODUCTIVITY-DRIVEN APPROACH

Normally, the entire administrative set up of any Government Department is geared to er re process accountability and transactional governance. In the case of the Departme of Education this means ensuring following of timelines, attendance, timely conduct of e n, holding of events, attendance of trainings and seminars etc.

The entire process of implementing CAL represents a paradigm shift towards ens g productivity. There is a transformation in the entire thought process whereby a thorough y of the specific problems was done, and a need-based programme mooted keeping in vie e specific requirements of the children. In making the primary players in the initiative th L Resource team a key part of the decision-making process, ownership and hence comn d execution of the project are a given. Comprehensive training, feedback and follow-up e e that key implementers teachers and heads of school are empowered with the requisite sk o ensure effective implementation. Monitoring and review systems have been put in pl o ensure ongoing improvement. And finally, critical support from the leadership at all le – State, District, Zone, School and from all systems for proper planning for implementatio d monitoring has been provided throughout the project, from conceptualization to evaluatio

The endeavor is to ensure quality education along with quantity, prepare the wa r disadvantaged students to excel, provide a conducive atmosphere for learning, d transformation from barely meeting thresholds to achieving greater laurels and bri g Government Schools on par with the best schools in the country.

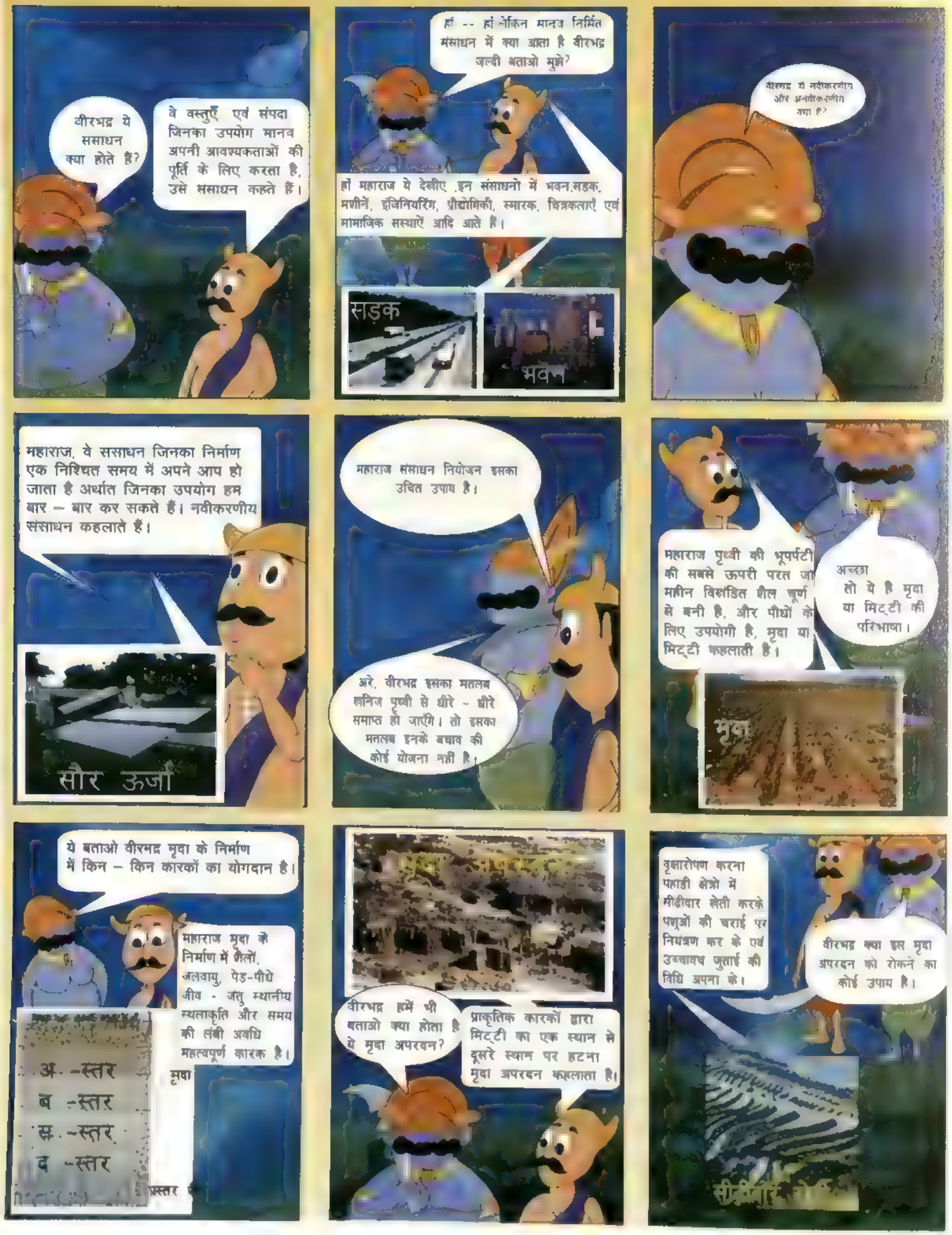
Samples : From textbook to CAL...

Sub: Social Science (NCERT)
Class X
Chapter: Bhumi Aur Mirda Sansadhan

भूमि और
मृदा संसाधन

Department of Education
Delhi Government
Sub: Social Science (NCERT)
Class: X
Chapter:Bhumi Aur Mirda Sansadhan

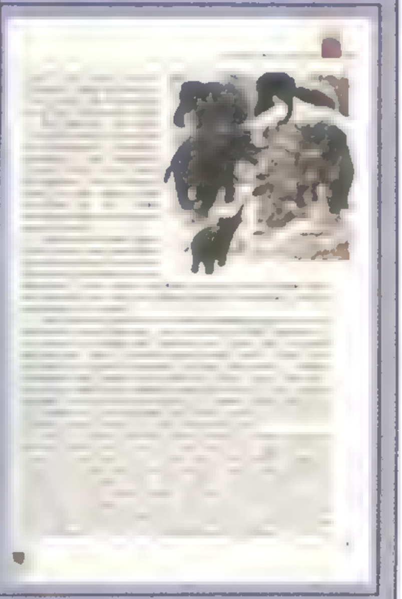
Selected clips from CAL toonz film

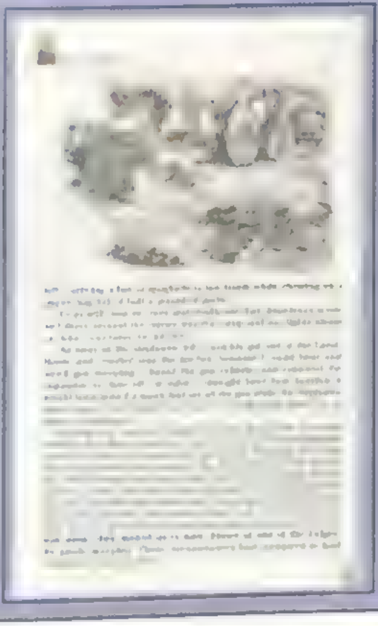

वीरभद्र ये ससाधन क्या होते हैं?
वे वस्तुएँ एवं संपदा जिनका उपयोग मानव अपनी आवश्यकताओं की पूर्ति के लिए करता है, उसे संसाधन कहते हैं।
हाँ -- हां लेकिन मानव निर्मित संसाधन में क्या आता है वीरभद्र जल्दी बताओ मुझे?
हाँ महाराज ये देखीए ,इन संसाधनों में भवन,सडक, मशीनें, इंजिनियरिंग, प्रौद्योगिकी, स्मारक, चित्रकलाएँ एवं सामाजिक सस्थाऐं आदि आते हैं।
सड़क
भवन
वीरभद्र ये नवीकरणीय और अनवीकरणीय क्या है?
महाराज, ये ससाधन जिनका निर्माण एक निश्चित समय में अपने आप हो जाता है अर्थात जिनका उपयोग हम बार – बार कर सकते हैं। नवीकरणीय संसाधन कहलाते हैं।
सौर ऊर्जा
महाराज संसाधन नियोजन इसका उचित उपाय है।
अरे, वीरभद्र इसका मतलब खनिज पृथ्वी से धीरे - धीरे समाप्त हो जाएँगे। तो इसका मतलब इनके बचाव की कोई योजना नही है।
महाराज पृथ्वी की भूपर्पटी की सबसे ऊपरी परत जो महीन विखंडित शैल चूर्ण से बनी है, और पौधों के लिए उपयोगी है, मृदा या मिट्टी कहलाती है।
अच्छा तो ये है मृदा या मिट्टी की परिभाषा।
मृदा
ये बताओ वीरभद्र मृदा के निर्माण में किन – किन कारकों का योगदान है।
महाराज मृदा के निर्माण में शैलों, जलवायु, पेड़-पौधे जीव - जंतु स्थानीय स्थलाकृति और समय की लंबी अवधि महत्वपूर्ण कारक है।
अ -स्तर
ब -स्तर
स -स्तर
द -स्तर
मृदा
प्रस्तर
वीरभद्र हमें भी बताओ क्या होता है ये मृदा अपरदन?
प्राकृतिक कारकों द्वारा मिट्टी का एक स्थान से दूसरे स्थान पर हटना मृदा अपरदन कहलाता है।
वृक्षारोपण करना पहाडी क्षेत्रो में सीढ़ीदार खेती करके पशुओं की चराई पर नियंत्रण कर के एवं उच्चावच जुताई की विधि अपना के।
वीरभद्र क्या इस मृदा अपरदन को रोकने का कोई उपाय है।
सीढ़ीदार खेती

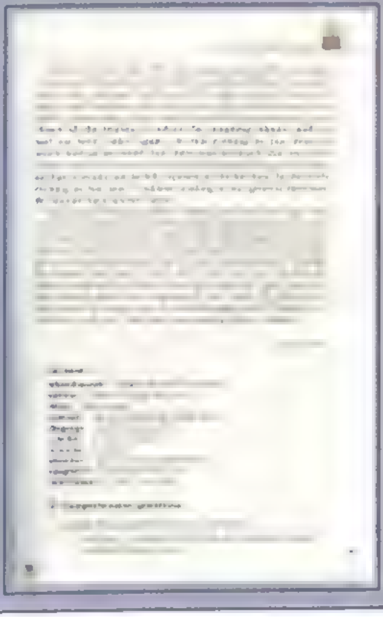
: English (NCERT)
s: X
pter: Elephants Raid a Kitchen

7

Elephants Raid a Kitchen

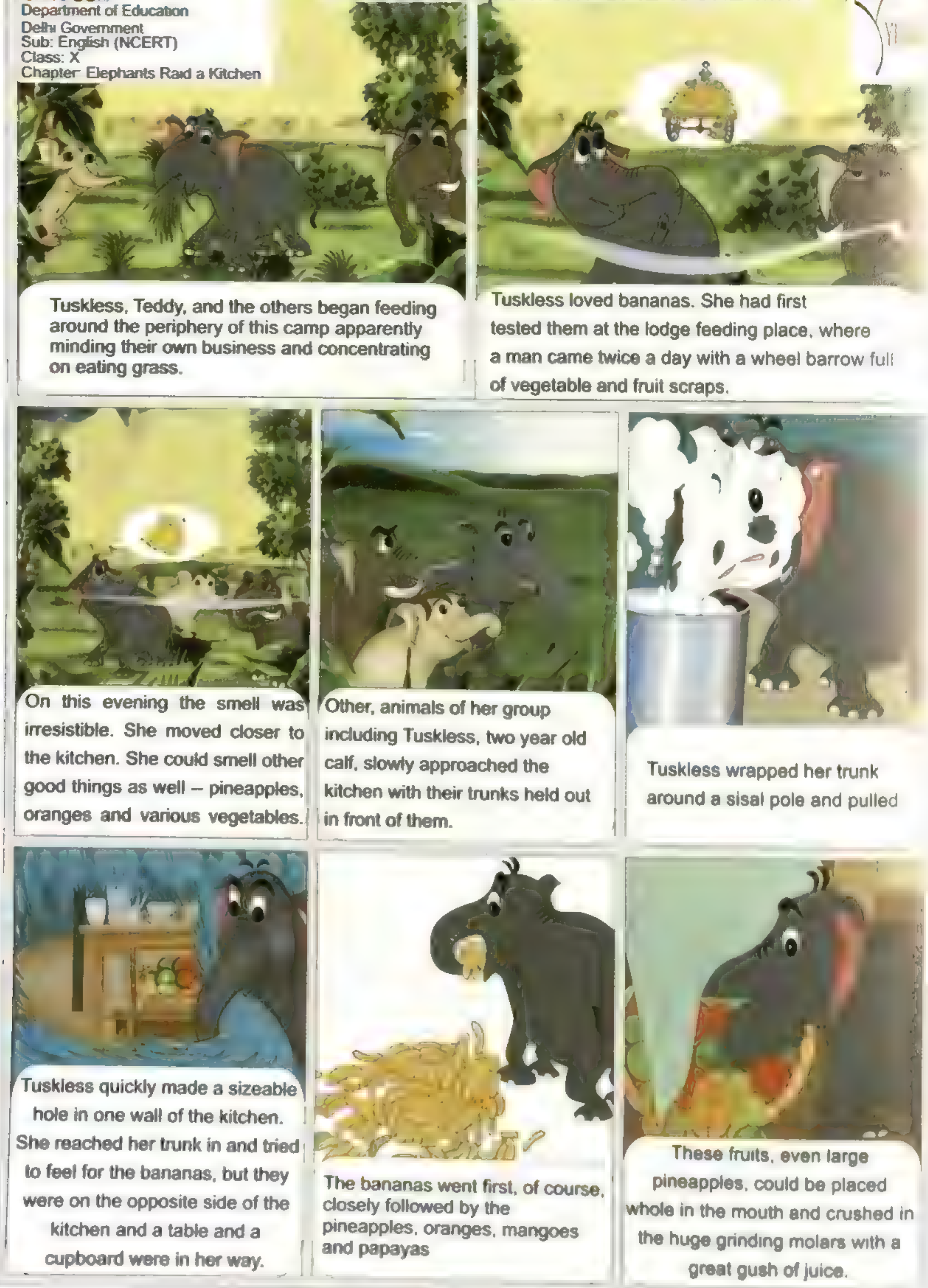






Selected clips from CAL toonz film

CAL toonz
Department of Education
Delhi Government
Sub: English (NCERT)
Class: X
Chapter: Elephants Raid a Kitchen



Tuskless, Teddy, and the others began feeding around the periphery of this camp apparently minding their own business and concentrating on eating grass.

Tuskless loved bananas. She had first tested them at the lodge feeding place, where a man came twice a day with a wheel barrow full of vegetable and fruit scraps.

On this evening the smell was irresistible. She moved closer to the kitchen. She could smell other good things as well – pineapples, oranges and various vegetables.

Other, animals of her group including Tuskless, two year old calf, slowly approached the kitchen with their trunks held out in front of them.

Tuskless wrapped her trunk around a sisal pole and pulled

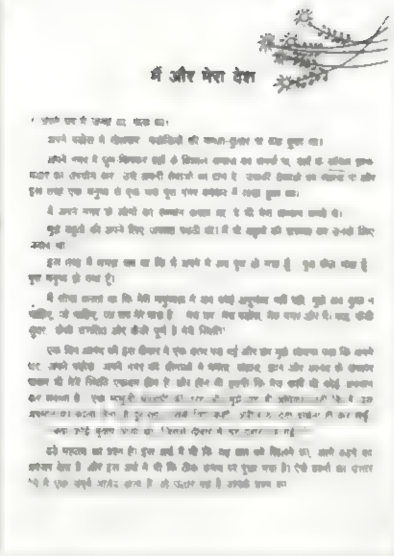
Tuskless quickly made a sizeable hole in one wall of the kitchen. She reached her trunk in and tried to feel for the bananas, but they were on the opposite side of the kitchen and a table and a cupboard were in her way.

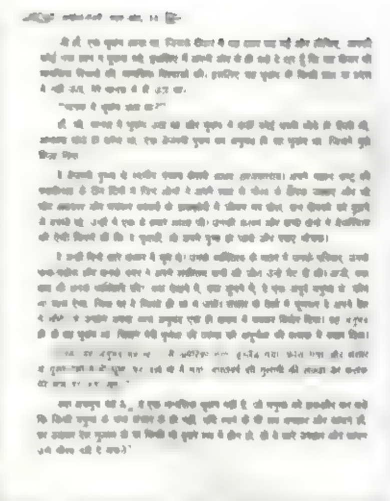
The bananas went first, of course, closely followed by the pineapples, oranges, mangoes and papayas

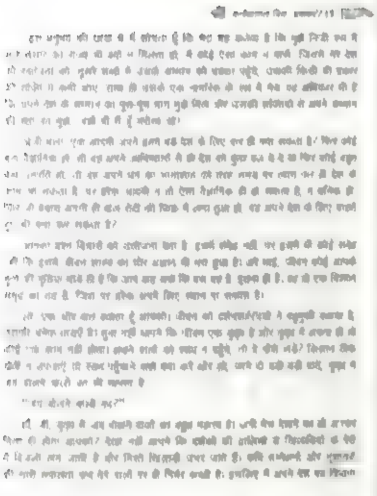
These fruits, even large pineapples, could be placed whole in the mouth and crushed in the huge grinding molars with a great gush of juice.

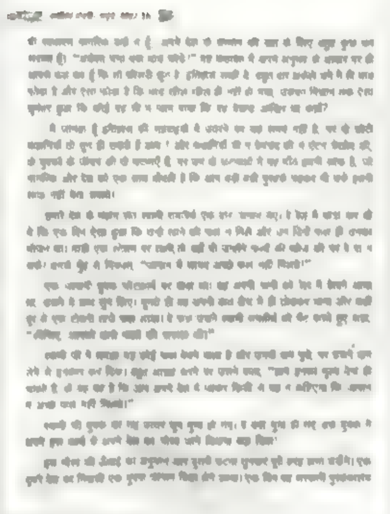
Sub: Hindi (NCERT)
Class: X
Chapter: Mein aur mera desh

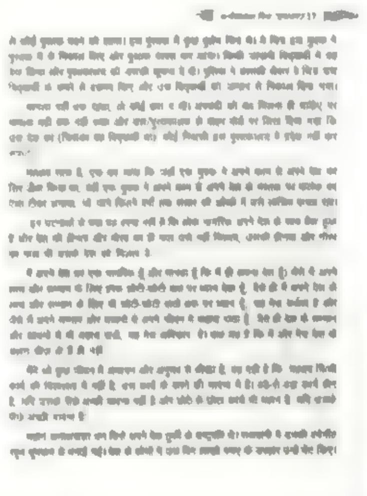
मैं और मेरा देश

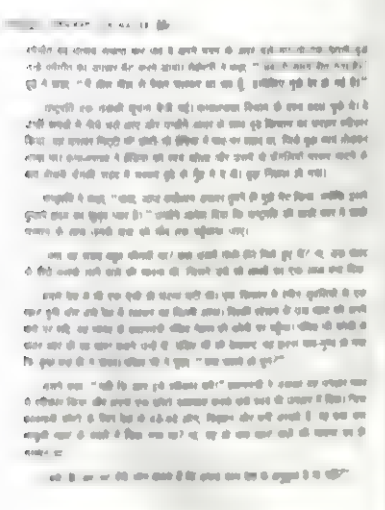


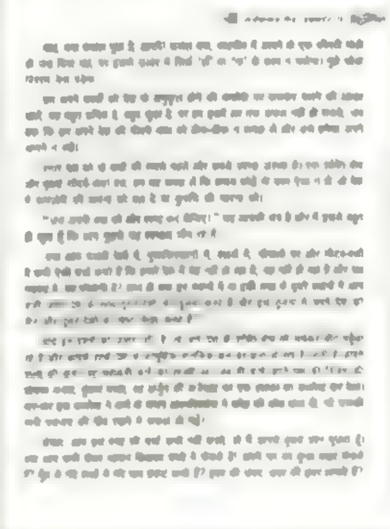






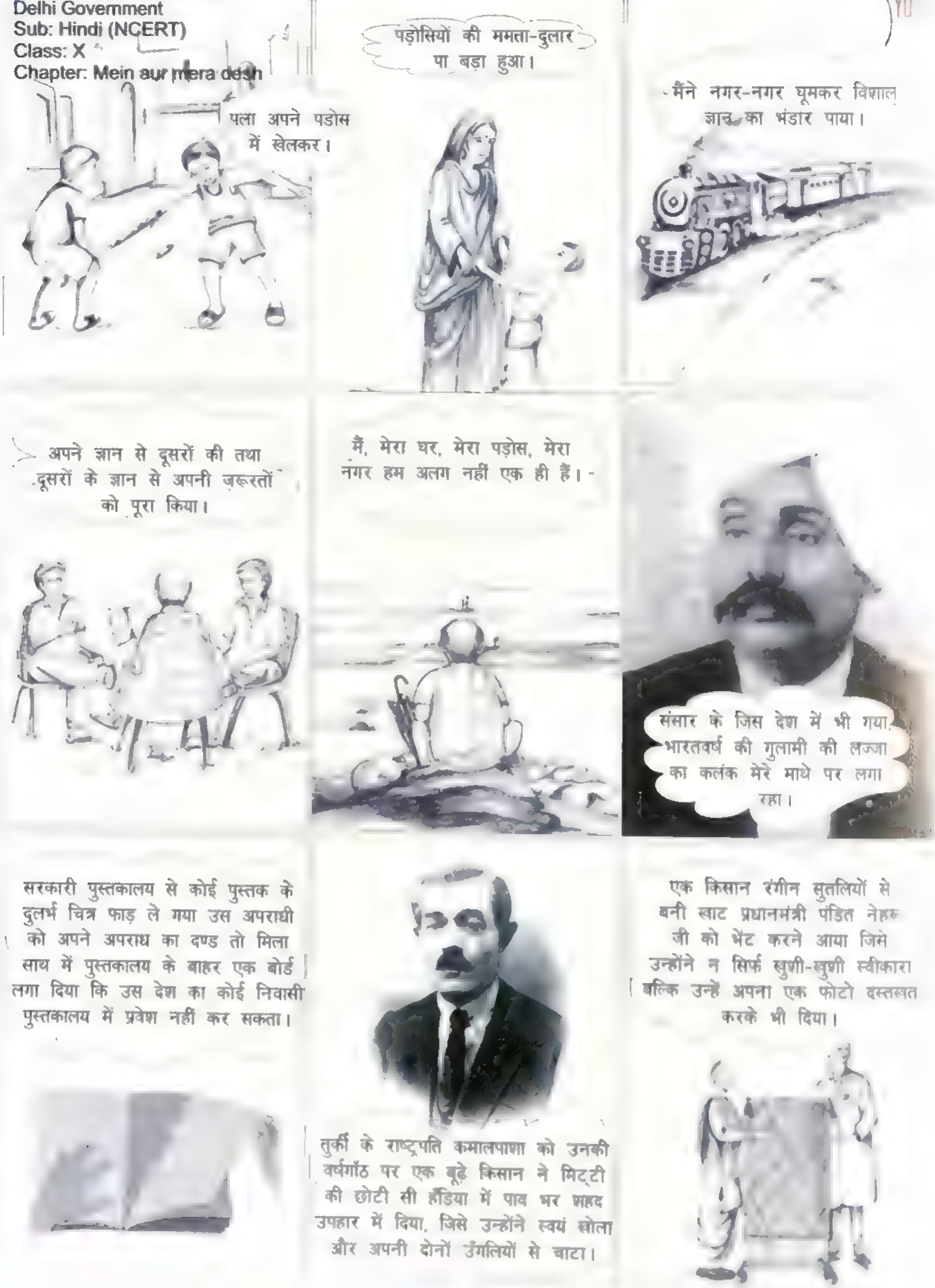






CAL toonz
Department of Education
Delhi Government
Sub: Hindi (NCERT)
Class: X
Chapter: Mein aur mera desh

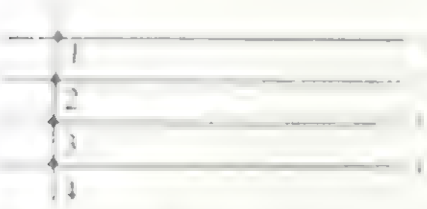
Selected clips from CAL toonz film


पला अपने पडोस में खेलकर।
पड़ोसियों की ममता-दुलार पा बड़ा हुआ।
मैंने नगर-नगर घूमकर विशाल ज्ञान का भंडार पाया।
अपने ज्ञान से दूसरों की तथा दूसरों के ज्ञान से अपनी ज़रूरतों को पूरा किया।
मैं, मेरा घर, मेरा पड़ोस, मेरा नगर हम अलग नहीं एक ही हैं।
संसार के जिस देश में भी गया, भारतवर्ष की गुलामी की लज्जा का कलंक मेरे माथे पर लगा रहा।
सरकारी पुस्तकालय से कोई पुस्तक के दुलर्भ चित्र फाड़ ले गया उस अपराधी को अपने अपराध का दण्ड तो मिला साथ में पुस्तकालय के बाहर एक बोर्ड लगा दिया कि उस देश का कोई निवासी पुस्तकालय में प्रवेश नहीं कर सकता।
तुर्की के राष्ट्रपति कमालपाशा को उनकी वर्षगाँठ पर एक बूढ़े किसान ने मिट्टी की छोटी सी हँडिया में पाव भर शहद उपहार में दिया, जिसे उन्होंने स्वयं खोला और अपनी दोनों उँगलियों से चाटा।
एक किसान रंगीन सुतलियों से बनी खाट प्रधानमंत्री पंडित नेहरू जी को भेंट करने आया जिसे उन्होंने न सिर्फ खुशी-खुशी स्वीकारा बल्कि उन्हें अपना एक फोटो दस्तखत करके भी दिया।

Sub Math (SCERT)
Class: VI
Chapter: Multiplication

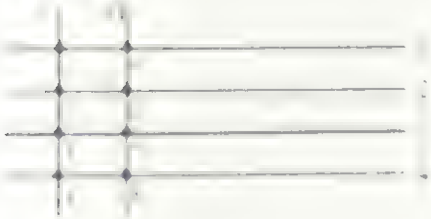
आइए झाड़ू की तीलियों के प्रयोग से गुणा करें।

अगर चार लेटी हुई तीलियों के ऊपर हम एक उन्हें काटती हुई खड़ी तीली रखें तो आप देखते 4 बिन्दुओं पर मिलती हैं।

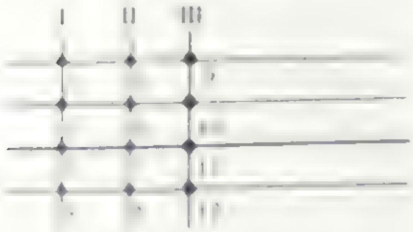


इस तरह हम देखते हैं 4 × 1 = 4

इसी तरह अगर हम दो तीलियां खड़ी रखें तो आप देखते हैं कि यह 8 बिन्दुओं पर मिलती हैं।



इसे हम ऐसे भी लिख सकते हैं 4 × 3 = 12



4 × 1 = 4
4 × 2 = 8
4 × 3 = 12
4 × 4 =
4 × 5 =
4 × 6 =
4 × 7 =
4 × 8 =
4 × 9 =
4 × 10 =

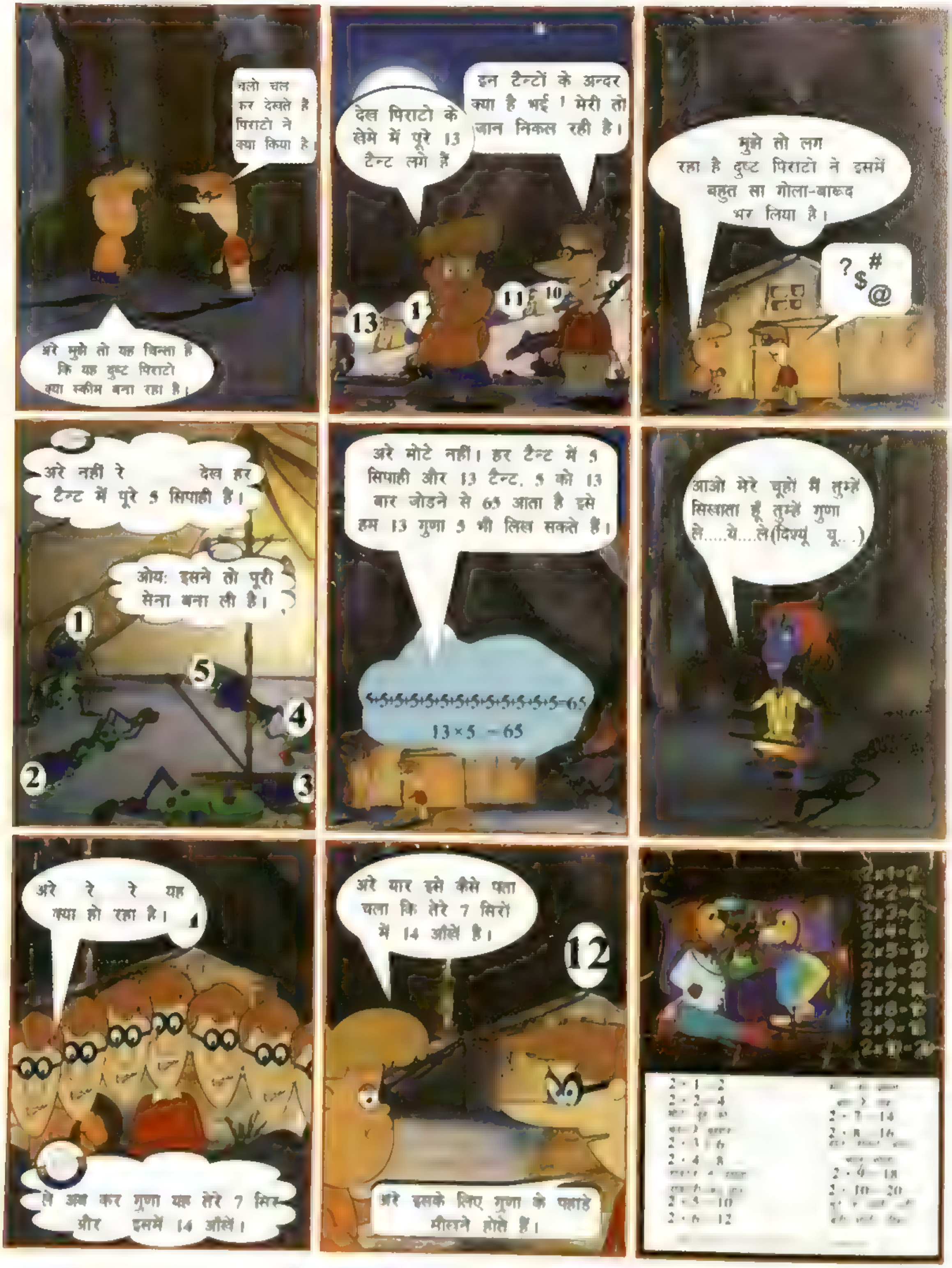
इसी तरह 3 4 5 6 7 8 9 तथा 10 तीलियों का प्रयोग करते हुए देखें कि यह कितने

मिलती हैं। दी गई तालिका में लिखिए।

CAL toonz
Department of Education
Delhi Government
Sub: Math (SCERT)
Class: VI
Chapter: Multiplication

Selected clips from CAL toonz film

YUVA


चलो चल कर देखते है पिराटो ने क्या किया है।
अरे मुझे तो यह चिन्ता है कि यह दुष्ट पिराटो क्या स्कीम बना रहा है।
देख पिराटो के खेमे में पूरे 13 टैन्ट लगे हैं
इन टैन्टों के अन्दर क्या है भई ! मेरी तो जान निकल रही है।
13
1
11
10
9
मुझे तो लग रहा है दुष्ट पिराटो ने इसमें बहुत सा गोला-बारूद भर लिया है।
?$#@
अरे नही रे देख हर टैन्ट में पूरे 5 सिपाही है।
ओय: इसने तो पूरी सेना बना ली है।
1
5
4
2
3
अरे मोटे नहीं। हर टैन्ट में 5 सिपाही और 13 टैन्ट, 5 को 13 बार जोडने से 65 आता है इसे हम 13 गुणा 5 भी लिख सकते है।
5+5+5+5+5+5+5+5+5+5+5+5+5=65
13×5 =65
आओ मेरे चूहों मैं तुम्हें सिखाता हूँ तुम्हें गुणा ले.....ये....ले(दिश्यूं यू...)
अरे रे रे यह क्या हो रहा है।
ले अब कर गुणा यह तेरे 7 सिर और इसमें 14 आँखें।
अरे यार इसे कैसे पता चला कि तेरे 7 सिरों में 14 आँखें है।
12
अरे इसके लिए गुणा के पहाडे सीखने होते है।
2x1=2
2x2=4
2x3=6
2x4=8
2x5=10
2x6=12
2x7=14
2x8=16
2x9=18
2x10=20
2×1=2
2×2=4
2×3=6
2×4=8
2×5=10
2×6=12
2×7=14
2×8=16
2×9=18
2×10=20

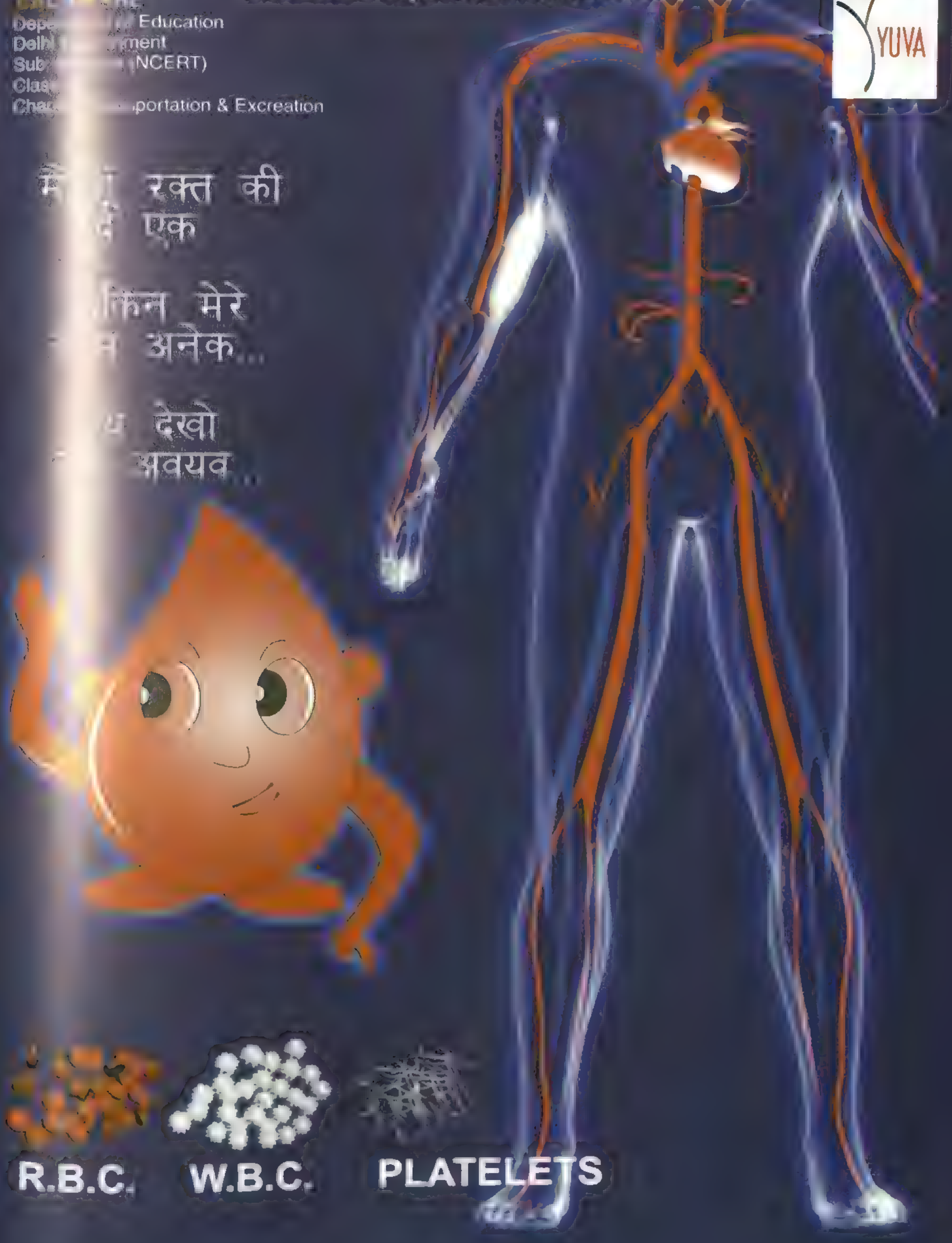
Selected clips from CAL toonz film

CAL [illegible]nc
Dep[illegible] Education
Delhi [illegible]ment
Sub[illegible] (NCERT)
Clas[illegible]
Cha[illegible]portation & Excreation

[illegible] रक्त की
[illegible] एक

[illegible]किन मेरे
[illegible] अनेक...

[illegible] देखो
[illegible] अवयव...


R.B.C.
W.B.C.
PLATELETS

SECTION IV

THE WAY FORWARD: CALtoonZ

Chapter 1 Next Steps

The characteristic of the CAL Pilot of the Delhi Department of Education that sets it apart from available multi-media packages is that it is truly need-based:

i. it has been created by the system's own teachers
ii. it has been tested in the context of the system's own schools
iii. it is based on the current syllabus

Based on the outcomes and learnings of the CAL Pilot, the Department of Education is taking CAL forward across the school system. Given that the requirement of clear, interesting and concise content delivery extends to all classes, the entire curriculum, from Class I to Class XII, will be converted into interactive multimedia based content, so that the Teaching-Learning process becomes more joyful, easy and interesting, and students are attracted to the classroom.

Immediate Next Steps

Recognizing the enormous potential of Computer Aided Learning to bring to Delhi schools the joy of learning, thereby improving student performance and retention and completion rates, the Department of Education is establishing a second CAL Resource Centre in Delhi.

The next step being undertaken is introduction of Class X content for CAL delivery. Class X represents a very significant milestone in children's education. The Class X CAL programme will be launched on 4th September 2006, a year to the day since the CAL pilot for Class VI was launched.

Meanwhile, an intensive School Adolescent Education Programme (SAEP) launched throughout the DoE schools to equip all students from Classes VI to XII with the requisite life-skills, as defined by the World Health organization, is being converted to CAL multimedia content. CALtoonZ and SAEP together under the umbrella of the Department of education's flagship programme-YUVA- will ensure that students come out of the system ready to make intelligent and informed choices for leading a life of dignity.

In a landmark decision, the Department of Education has decided to involve the senior students in the conceptualisation, design, preparation and implementation of their curriculum. This will start with the SAEP and the students will also function as Peer Educators.

Chapter 2

Planning for Implementation and Monitoring of CALtoonZ

Need Analysis

In order to develop a contextually relevant product that is need-based, it is important to study the need of students and teachers in the system's own schools.

Data-gathering could include both quantitative data and qualitative data on the following:

- student achievement: subject-wise, concept-wise (to identify difficult concepts)
- teacher knowledge of content and pedagogy
- concerns of district officials, Heads of Schools, teachers, students and parents
- levels of motivation of teachers and students

Methodologies for gathering data would include standardized tests to assess student knowledge and identify difficult concepts, classroom observation, questionnaires and individual and focus group interviews with different stakeholders etc. Analysis of data gathered would identify the specific needs that have to be addressed by the use of multimedia content.

Setting up a CALtoonZ Resource Centre

> All planning must be done with representation of Heads of Schools, District and Zonal officials, teachers and students, so that all perspectives are present and ground level information is brought in.

A core team of teachers, department officials, subject-experts and specialists would have to work together to conceptualize the project and lead the process of hiring, vision-building and strategic planning to take the project forward. A budget would need to be developed and ongoing funding ensured for a minimum of 5 years or until the CALtoonZ Resource Centre becomes self sustaining. Systems would need to be put in place for the recruitment and selection of staff, their training, and for administration and financial management.

Setting up of CALtoonZ Classrooms in Schools

Ideally, there should be CALtoonZ in every classroom. Initially, however, it would be good to have at least 2 CALtoonZ classrooms per school, one for primary classes till Class V, and one for the senior classes. In bigger schools, more CALtoonZ classrooms should be set up. The CALtoonZ classrooms could also be used for other materials such as UNICEF's Meena series.

C oonZ classrooms essentially have to contain the following equipment, fixtures and fu ture::

- ie Computer CPU with UPS
- ie 29” Television Monitor
- mputer Cabinet
- ourful Chairs

[illegible]

The monitor must be comfortably visible from all corners of the room, hence should be mounted diagonally in one corner across the room, away from the door

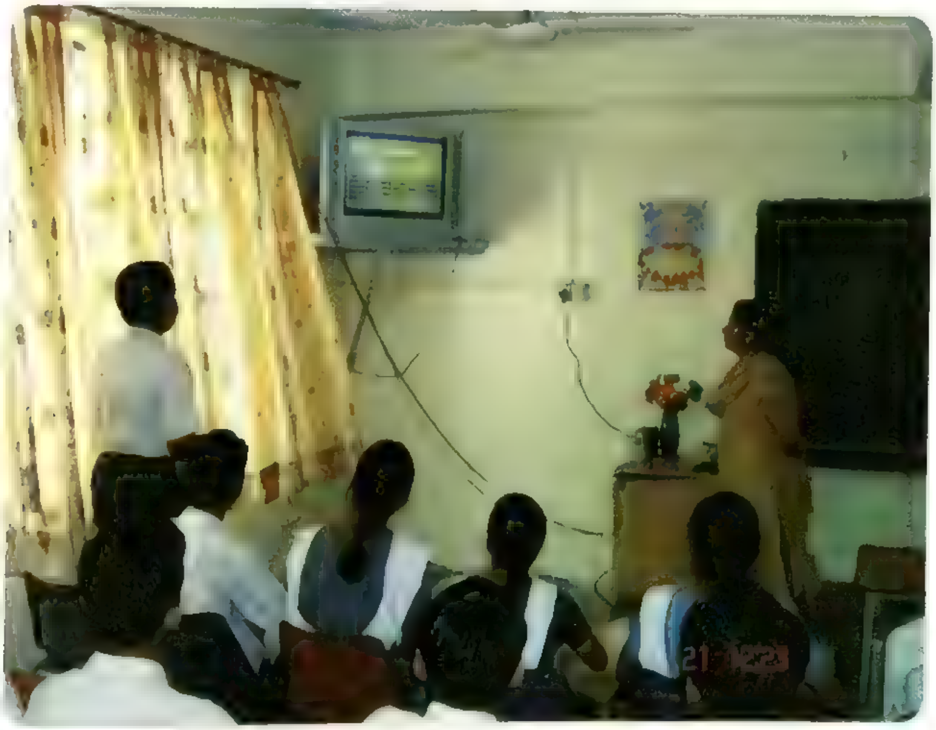
A child sitting in the front row should not block the vision of a child in the back rows

The monitor must not be within reach of children: a height of about 7 feet high is optimal

The teacher should have easy access to the CPU as well as the blackboard

A cordless mouse should be used

Electrical fittings should be safe



Things to remember:

- **Short School Hours and Narrow Approach Roads:** The installation team should plan in consultation with schools to ensure that access to school premises and the designated classroom are not a problem.
- **Storing the Goods:** Procurement and storage require careful planning, since very large numbers of chairs, computers etc. are involved.
- **Number of Seats:** 40 regular chairs with writing tablet fit easily into a normal sized classroom. Extra stackable chairs and provision of durrees can increase flexibility and extend the room's seating capacity.
- **Ownership of Equipment**: The safety of equipment is always a concern. It is very important that the School Principal is made responsible for the equipment.
- **Ensuring Electrical Connections:** In rural areas there might be schools with inadequate electrical connection. These schools have to be assisted before the equipment is moved in.
- **Ensuring Children's Safety:** Grounding of the electrical connections is another major concern. Keeping in mind the safety of the children, it must be ensured that there is an admin team overseeing the installation. This team should have clear instructions that no equipment will be installed in any school where the electrical connections were not properly grounded. Putting electrical engineers on the team to visit each school prior to installation to check the electrical wiring will speed up the process. Engineers could carry spare switches/wires to fix minor problems on the spot.
- **Creative Solutions:** There will be minor issues in some schools such as part of the walls might need to be repaired to take the weight of the TVs in some schools and in some others, the window may need to be covered to ensure that the equipment was not damaged during rains. Principals of such schools often have to be reminded about where they can draw funds from for carrying out the repairs. Principals must be empowered and motivated to take ownership of the CAL project; they are then quite likely to find their own solutions.

Training & Implementation

Although the CALtoonZ project is extremely user-friendly, the Heads of Schools and teachers who are to use CALtoonZ must be trained thoroughly both in computer operations and in the pedagogy of CALtoonZ.

Given the large number of teachers to be trained, it is important to develop a CALtoonZ Resource Group, preferably at the District level, with the involvement of DIET faculty. The TOT module must include understanding of CALtoonZ pedagogy, operation of the software, basic facilitation concepts and group processes like grounding, roles of facilitator and recorder, Principles of Adult Learning etc.

The output of the TOT should be a teacher training module complete with details on resources required for each session, the role of the facilitator for each session and materials required.

Teacher training must follow for a minimum of 15 days in operation of computers and on the CALtoonZ module generated by the Master Trainers for the handling of multimedia content. Nodal CALtoonZ Classrooms should be identified and equipped to serve as training and networking centres.

Orientation workshops are necessary to help the Heads of Schools understand the purpose and processes of the CALtoonZ project: how CALtoonZ will aid in building and consolidating knowledge using technology and thereby improve retention and quality. The session must help Heads of Schools think through the administrative, technological and academic issues that might come up during implementation, including how to support their teachers in the new endeavour, and possible ways of dealing with problems, with the support of the CAL District and State level Resource Teams.

Timetable Development

Timetable Development is a complex matter since the CALtoonZ classroom has to cater to schools with diverse needs e.g. some schools have 2 sections in a class, others up to 22 or more. The CALtoonZ Resource Centre shall issue guidelines for timetable development and let the actual timetable be developed in the school.

Guidelines For Support And Monitoring

Monitoring and review systems must be put in place to ensure ongoing improvement.

- An online response system for feedback from teachers must be developed (i) using a standardized format (ii) with provision for informal responses.
- A Help Desk or Cell at State level and in the DIETs at District level would greatly facilitate trouble-shooting and effective implementation.
- Performance measurement should be done by a common public exam given to all the students regardless of whether they are studying with the help of CALtoonZ or not. This helps in ascertaining the effectiveness of the entire process.
- A system of regular supervision and online reporting on standardized formats by District and Zonal Officials and Heads of Schools must be put in place.
- A regular system of analysis of feedback, monitoring reports and student performance must be put in place to feed into immediate improvement if possible and into the next planning cycle.
- An external evaluation must be commissioned annually to assess impact and identify areas for further improvement.

CHAPTER 3

erstanding the Pedagogy of Computer-Aided Learning

puter-Aided Learning implies a pedagogy or science of teaching that is different from the ional classroom. Computer-Aided learning technology harnesses four specific ntages to enhance the quality of learning possible in the classroom[14]:

- Access to Quality Information
- Learner Engagement
- Response Time
- Individualized Learning

[illegible]

environment in which access to information of all kinds is severely limited both for hers and for students and in which textbooks frequently confuse rather than clarify, uter-aided instruction provides the opportunity to ensure that accurate and prehensive information is provided on every concept.

her, CAL technology makes it possible to ensure that the information is clearly presented ollows principles of instructional effectiveness. And in an environment in which teachers lack motivation, concept clarity, or instructional skills, CAL technology makes it possible andardize the information provided in every classroom.

[illegible]

r too many Government schools the environment is rarely conducive to learning. Students ot enjoy going to class and are reluctant to undertake the tasks generally assigned by hers. There is frequently an atmosphere of boredom and apathy both on the part of chers and of students. CAL technology is especially important in such environments since it ables learner engagement. In a CALtoonZ classroom students, and indeed even teachers, e enthralled by the multimedia presentation, and by the games and puzzles programmed to stimulate interest and increase challenge. Games and puzzles and challenging tasks can be a part of any traditional classroom, but depend on the creativity of the teacher. Increased learner engagement resulting from increased interest in instruction inevitably translates into increased learning and improved student performance.

[illegible]

The computer software is developed to provide optimal response time: longer when a concept is new or especially difficult, and increasingly short when the content is understood and the level of challenge needs to be increased. Research has proven that shortened response time heightens learner engagement and increases learning.

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[14] Based on the widely-cited work of John Spence on the Virtual Classroom

Computer-Aided Learning also provides the opportunity of having students practice o eir own with the computer or providing them access to the information for revision or repet of the concepts taught in class. With computer labs available in all Government schoo is opens up the possibility that students can access guided learning outside the classro nd possibly after school hours.

Shift from "a Sage on Stage" to "a Guide from the Side"

The new role of teachers in the CALtoonZ classroom was discussed before developm f multimedia content. The team envisaged the teacher as requiring a fresh attitud w classroom atmosphere and lots of motivation. At the outset the teacher would ha o understand the objectives of CALtoonZ and what kind of classroom management wo required so that the project is consistent with the curriculum.

In the first week the teacher would help the children to not feel threatened by th technology, tell them that it is a fast and effective medium of learning. The teacher ensure that every child gets equal proficiency and comfort on the computer and thereb students taste success first.

While the teacher would not need to decide how to teach a topic, as the computer program present that, s/he would need to organize, monitor and regulate student activities classroom. The teacher's role would be to direct students to specific learning outcome teacher needs to ensure that students understand what they need to take from the multi content and how it is to be used. For example, jingles and songs that summarize content c become a substitute format for the information to be regurgitated in a test or exam.

The teacher would have to assess where each student is in terms of knowledge of topi d decide how much needs to be taught and at what level and how much practice is needed. he teacher would continuously monitor the understanding of the learner and explain to fill gaps and manage movement to the next difficulty level.

The teacher would need to be proficient in running the CALtoonZ program and ensure that the whole concept plays without interruption once and then decide whether to stop and explain, replay, go to the previous topic or move to the next topic.

A simple way of explaining the new role of a teacher in this setting is to think of a cyclist learning to ride a motorcycle. The only thing that has changed is the fitting of an engine. The rider still has to make all decisions about where s/he is headed, when to stop, when to turn and also to maintain a balance at all times.

T Teacher needs :

- To motivate learners to use computers as a learning medium
- To facilitate every learner to operate the CALtoonZ program on the computer
- To ensure all learners are attentive throughout the CALtoonZ program
- To note down deficiencies and uneasiness during CALtoonZ program
- To maintain time and adjustment for CALtoonZ with the main teaching
- To allow learners to access teaching learning material by allowing them to work with the software system safely
- To address discipline problems arising from a large number of students (group work or division of large class into two parts)
- To ensure that children are working out problems and writing in notebooks
- To be able to control the classroom in adverse situations such as failure of the system, electricity, disturbance etc.

teacher's role changes in a CALtoonZ classroom from `a sage on the stage' to `a guide from side.'

teacher is no longer the center of attention as the dispenser of information, but rather plays the role cilitator, moving from student to student or group to group, providing suggestions and support for ent activity, assessing the need of each student or student group and taking decisions on what es next, more input or more practice.

students watch the technology-supported products, the teacher can watch for the complete olvement of all students, check whether all students have understood a concept before moving on to next topic and set interesting class work to consolidate the students' learning.

providing an interesting medium, clear concept delivery, and a database of graded questions, the ALtoonZ program would reinvent the classroom and the teacher's role. Most importantly, it would rovide an environment and tools for the teacher to facilitate learning, by helping students actively engage with and consolidate concepts.

Transacting The Concept

uence of Teaching by means of CALtoonZ and by textbook

As per the general principle of pedagogy of introducing the simpler concept followed by the abstract, the easier to understand and concrete CALtoonZ content should be shown first, followed by any teaching from the textbook.

her Intervention

- Given the limited instruction time in the typical school year, it is critical to save time on delivering input and free up time for student engagement to process information. For explanation of a concept, the multimedia lesson takes a fraction of the time that is taken by the traditional chalk and talk method.
- Since the optimum attention span of a small child is 3-4 minutes, after presentation of information for 3-4 minutes, the teacher needs to step in to monitor understanding and clear

doubts. This way, CALtoonZ can be shown for 35 minutes to 1 hour at a time.

When a teacher uses CALtoonZ, s/he has at her disposal, for every concept, an in[illegible]ble package of aids on the computer:

- The content, in audio visual medium
- A summary of the topic in text, for children to note down
- Diagrams, if any
- Questions and Answers of all types
- Interactive games and puzzles
- Songs summarizing the concept

Repetition & Reinforcement

In CALtoonZ, there may be two types of repetition:

- Repetition of the concept within the same chapter
- Repetition of the entire chapter.

Repetition of the concept within the same chapter

- Although the number of repetitions required varies from person to person and [illegible] topic, an average person needs at least 15 repetitions of the same thing to begin to [illegible] into long term memory. Repetition should be built into the chapter, but care ha[illegible] taken to ensure the material continues to hold the students' interest.
- Children should also be encouraged to do some homework based upon the chapte[illegible] was taught with the help of their textbooks.
- In this way, it will be ensured that there are six "repetitions" of the concept on the [illegible] day of teaching.
- The script writer must ensure the repetition of the textual material at least thrice [illegible] will ensure that whatever was taught in the chapter in the class is easily recalled.
- It is the responsibility of the subject-expert scripting the lesson to decide how to go [illegible] emphasizing the main points and concepts.
- A concept must be reviewed intensively over the first few days after it is presented, including active processing by the student, and reviewed again after a 5 to 7 day gap.
- During review, ongoing assessment by the teacher, of student learning, is essential, before the learning is evaluated by means of a test of some kind.

Repetition of the entire chapter

- Repetition of a chapter is generally only a form of revision, prior to a scheduled test or exam.

Repetition of songs

Songs summarizing the text should be repeated at regular intervals whenever there is some leisure time. Even audio cassettes/CDs of the songs may be available to children so that they can listen to them on their own, using computer lab facilities etc.

Chapter 4

Guidelines for Multimedia Content Development

Principles

- CALtoonZ content must be developed in-house by the system's own teachers, people who have deep understanding of the context
- External subject-experts must be called in as consultants to ensure cutting-edge knowledge is brought into the system
- Content development must be research-based to ensure quality
- The content to be developed must be an integral part of the curriculum rather than an add-on
- The teacher and the students must be viewed as active participants in the CALtoonZ classroom, determining content to be viewed and exercises and group-work to be undertaken
- The core values underlying all content must be clearly defined by the Development team: relevant and secular content, principles of equity, diversity, gender sensitivity, non-violence, environment conservation etc.prior to starting development.
- Simplicity and concept clarity must be a key guiding principle.

The goal of increased learning must be the priority at all times and the choice of methodology, cartoons, storyline, film, puppetry, straight presentation of the information model etc. should be based on this goal alone.

Steps for Multimedia Content Development

Concept Mapping

The syllabus of the relevant class must be broken up into units, and these units then divided into graded learning objectives by a group of subject-teachers.

- Attempts should be made to give proper weightage to every topic of the prescribed syllabus
- Concept-mapping includes accurate and logical division of each chapter into topics and sub-topics
- Defining the Learning Objective is critical for clear presentation of information. At the time of listing, the subject expert should sequence topics and learning objectives within the topics in a graded manner, such that the teaching shall move from simple to complex, easy to difficult.
- While listing topics and sub-topics, the subject expert must clearly identify those areas that are difficult for the children to comprehend.

Gathering information

- Relevant interesting information on a unit must be gathered from the available reference material, encyclopedias, journals, Internet etc. to complement text-book material and provide opportunities to extend learning.

[illegible]

[illegible] a story must be woven around the final content. A story board must be prepared complete with models of the information, experiments, dialogues, narrations, jingles, and background music etc.

[illegible] while stories can be used occasionally, older children are able to deal with more abstract information. For higher classes the entire information must be laid out as a presentation with additional information identified (video clips, web-sites, references, slide-presentations etc.) for hyper-linking.

- The design of the teaching-learning process in multi-media must ensure that the information is presented clearly on screen, following the sequence of a lesson plan.
- The chapter and its topics must be clearly listed and shown every time a new topic is begun.
- At the beginning of each topic, the series of Learning Objectives must be stated clearly.
- The Learning Objective must be stated on the first frame of each lesson.
- Clear presentation of the concept is essential.
- Content delivery is through animated films and models.
- The concept must be presented in a simple form first so that every child understands and hence remains engaged.
- It would be an added advantage to state/review previous knowledge required to understand the new Learning Objective e.g. when teaching Multiples, reference would be made to Tables the children already know.
- Posing a question while introducing a concept will get children engaged and thinking.
- Difficult topics must be introduced gradually.
- Teaching should move from lower order concept explanation to higher order concept explanation
- Teaching should move from known to unknown and from concrete to abstract.
- Explain or clarify the concepts and then follow it with related abstract concepts
- In order to cater to all learning styles: (i) information should be presented in at least two different ways, such as by creating a visual model, animating it, providing auditory input and text (ii) the lesson design must include processing of information by students in at least two different ways, one active or hands-on, and the other reflective.
- Repetition of the content to enable drilling of concepts needs to be a part of the module.
- An audio visual model of the information should come first, with text superimposed thereafter.
- The scenes must be realistic and logical.
- Context should be related to concept, extensively using real life examples to explain topics.

- e should be exercised while explaining difficult technical terms by giving illustrations, ferably from everyday life, and then defining them.
- equential summary of the lesson is essential to recapitulate what was taught.
- ording to research, the optimum attention span of a child is 3-4 minutes. The lesson sign for CALtoonZ must therefore break information presentation into parts, each of 3-4 nutes, with the cued intervention of the teacher after each part.
- attempt should be made to use the same (uniform) format in every lesson.

Storyboarding entails designing the whole lesson, with points of teacher-entry clearly marked and 3-4 minute sequences for the following parts of a lesson:

  - monitoring learning
  - presenting information in a different way
  - providing opportunity and material for students to (a) process the information under the teacher's guidance (b) practice in a group and then alone (c) assess learning at the end of the lesson

ctive Models

- nteractivity is a critical part of computer-aided learning and a very important tool to enable drilling of concepts.
- Innovative exercises and games must be included both to facilitate reiteration of concepts as well as to make learning more joyful and interactive.

[illegible] Material for Guided and Independent Practice

An exhaustive set of questions of all types must be prepared matching columns, multiple choice, descriptive, open-ended etc. ***graded for complexity***, with every topic looked at from different angles and at several levels. It is important to provide questions for all levels of Bloom's Taxonomy, ensuring that the levels most frequently left out by both textbooks and teachers – Analysis, Synthesis, Evaluation – are covered. For higher classes, questions should be based on the CBSE pattern.

Computer games, puzzles, quizzes and other interactive games to be played by students, must be provided to consolidate and/or assess learning.

ns for T Detailed guidelines for teaching the lesson, achieving the learning outcomes, assessing learning and diagnosing need are to be developed for each learning objective.

Art-work

Character

- The artists and multimedia programmers should develop characters based on the stor is is an intense process whereby 13 to 30 drawings are made for one second of animation.
- Characters should not be copied from existing cartoons developed elsewhere
- Characters should be taken and named from diverse communities and should a e representative of different ability groups
- Characters should be related to real life situations: relevance increases both underst g and motivation to learn
- Characters should have Indian names
- Characters should be child friendly
- Characters should not be stereotyped: don't dress people in traditional dress associat h a particular religion
- The drawings are to be scanned and coloured
- Paintings or other images are made for the background, with characters to move e foreground.

Script & Language

- Spoken language is preferred over language used in the book
- In Science, Maths and Social Science, the language should be used in such a mann at technical terms are easily and well understood by the learner
- Bilingual texts should be used
- Text must be simplified
- A conscious effort should be made to avoid use of abstract words
- Language should be colloquial and supportive of image and action
- Difficult words may be explained and clarified by using related visuals
- In Science, Maths and Social Science, technical terms must be explained by even bre ng the terms
- Sound must not be very loud
- Children's voices should be used as far as possible
- Language must be easily understood and should be in clear and correct local accents
- All songs used in the content should be supported by text on screen

Visuals & Animation

- Storyboarding and scripting is followed by animation
- Visuals must register their presence by their movements
- Optimum screen usage is critical
- Movement of characters and vehicles must be uni-directional
- Narration must occur simultaneously with the relevant animation
- Text within the animation should be used sparingly

- The titles should be animated and must not be distracting
- Unnecessary camera zooming should be avoided as it disturbs the visuals
- Visuals' stay time on screen should be increased to register their presence
- There should be no blurring during the change of scenes
- Captions must be super-imposed at the correct places
- No more than 5 lines of text on a screen
- Black outline for diagrams
- Hot colours should be used sparingly
- A library of images, components and movements, should be developed so that they can be used elsewhere.

d & Voiceover

- The voiceover and recording of the dialogues, narration, jingles and other accompanying music must be completed in a high-quality sound studio.
- The child absorbs and reproduces the words as s/he hears them and the child tries to pronounce the words in the same manner as they are presented. It is critical to ensure proper pronunciation of words.
- The speed at which the script is spoken should be decided keeping in mind the needs of the students/target groups.
- It is critical to ensure that no words of the text present in the script are missing while recording the sound.

hing Touches

sound and video are to be amalgamated and interactive animation-based multimedia ntent produced.

iew and Field-test

- The finished content must be reviewed by a larger group of teachers and subject-experts and suggestions solicited.
- After incorporating the suggestions, the content should be tested on different groups of children to assess comprehension of the subject and interest. Changes must be made based on the feedback received.

Standardization of Technical Aspects

1. A standard user interface must be developed in which there is a standard navigation: i.e. back, forward, stop, pause, more info, play, exercise, exit etc. is standardized and is the same for all the subjects.
2. Standards must be fixed and guidelines issued in respect of technical specifications like frame rate, file size, image quality, sound quality etc.
3. A library of images, components and movements, should be developed so that they can be used elsewhere.

CHAPTER 5

Partnerships for Successful Implementation

Involvement of Primary Stakeholders

[illegible]

If the Department's own teachers develop the entire content and impart all the tea r trainings, there is a sense of ownership of the initiative and it is not perceived as some g being imposed upon them by the Department or any outside agency.

Students

Students must be involved at every stage including the pre-launch testing of the content s an ongoing process and intrinsic to the process of development and implementation.

Guidelines for Partnerships with Civil Society

With the concept of Public-Partnership still at a nascent stage nationwide in Departme f Education, the following points are important for effective PPP:

- For institutionalization of any initiative, it is critical that the Department takes own) of the whole initiative, with all its systems, processes, equipment and materials.
- Open lines of communication for dialogue to resolve concerns are the key to a succ l partnership.
- It is important that the expectations are clearly articulated by both sides to avoid any .
- While the government's decisions / actions would be guided by the need to avoid bias, i. y ensuring system-wide applicability, a corporate would also be guided by the abil o implement successfully, i.e. quality. A successful partnership hence entails focus on h equity and high quality.
- If effectiveness were the only criterion and equity were not important, corporates might want an MoU which allows the flexibility to shift equipment from a school which fails on implementation to another more "deserving" school. Given the "social justice" principles of public projects, the corporate can use its core competency in management to help the DoE to plan effectively and to devise context-specific support and monitoring steps for the various diverse contexts so as to ensure success of the initiative.
- The operating style of a corporate and that of a government department are very distinct. The focus should be to play to each other's strengths. Corporates can frequently support the Department in providing funds when stringent norms prevent quality production, they can source technical expertise, state-of-the-art management techniques etc. The Department can very swiftly mobilize the whole system to implement an initiative on a very large scale.
- Ability to remain involved for the entire cycle of implementation, monitoring and evaluation ensures that the rigour that is a corporate strength becomes integral to the whole project.

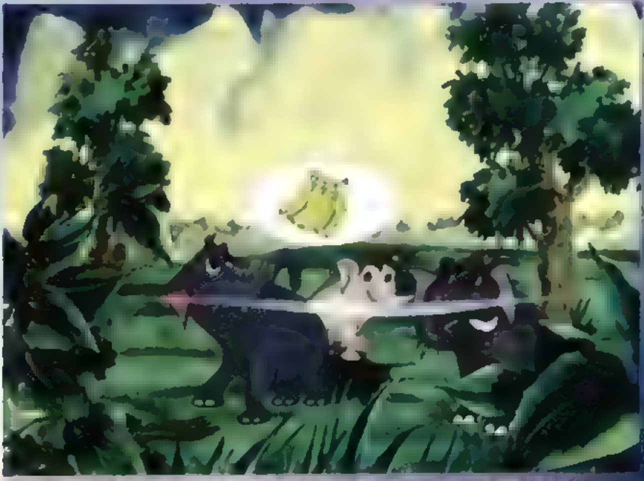
CHAPTER 6

Principles for Institutionalization

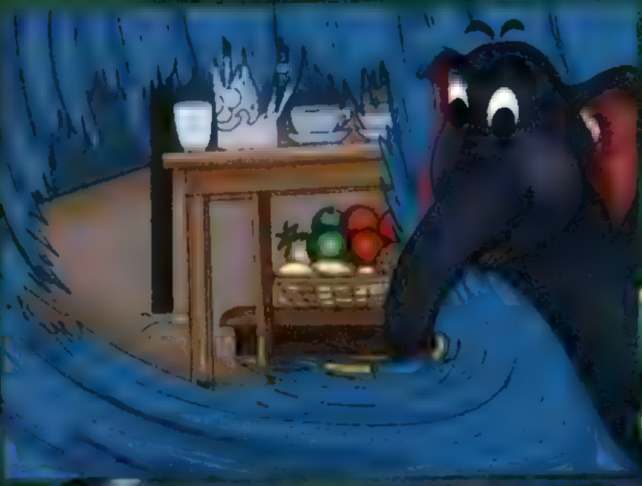
- Involvement of key stakeholders – Department officials, District officials, Heads of Schools, teachers, students and parents – in identifying the need, developing the vision and planning for implementation is important to ensure
    - (i) that decisions taken are informed by ground-reality
    - (ii) that those who have to implement the project have ownership of it.
- Support from the leadership at all levels – State, District, Zone, School – and systems for proper planning for implementation and monitoring is critical for institutionalization of the initiative. Willingness to take risks is a critical requirement for innovative projects in public systems.
- Taking an initiative to scale and ensuring institutionalization requires meticulous planning and monitoring. Decentralization to District and School level and empowerment through skill-building for effective implementation will lead to the different levels taking responsibility for the project. The State level team can monitor implementation and review feedback to inform further planning and development.
- Strong systems of support and monitoring at the State level will ensure effective implementation.
- Regular review of feedback from different levels at the CAL Resource Centre will ensure on the one hand that glitches do not stall the process and lead to disillusionment on the ground, and, on the other, lead to ongoing improvement.

Selected clips from CAL toonz film

CAL [illegible]nz
Depar[illegible] of Education
Delhi [illegible]nment
Sub: [illegible] (NCERT)
Class [illegible]
Chapt[illegible]phants raid a kit[illegible]



On this evening the smell was [illegible]



Tuskless quickly made a sizeable hole in one wall of the Kitchen

NNEXURE – 1

List of 200 Schools where CAL Programme is fucntional

NO	SCHID	SCHNAME	PHONE
	1001004	Kanti Nagar-SBV	22097781
	1001009	Anand Vihar-SV	22160771
	1001102	Surajmal Vihar-SKV	22373927
	1001104	Surajmal Vihar-RPVV	22169518
	1002002	Patparganj-SBV (Genda Lal Dixit)	22791533
	1002006	Mayur Vihar, Phase I, Pkt. II-SBV (Prem Chand)	22754461
	1002010	Trilokpuri, Block 20-SBV	22777222
	1002013	Dallupura-SBV	22619675
	1002015	Mayur Vihar, Phase II, Pkt.B-SBV	22789846
0	1002037	Khichripur-GGSSS	22773427
1	1002196	Shakarpur, No.1-SKV	22529397
2	1003003	Jheel Khurenja, No.1-SBV	22513890
3	1003004	Kailash Nagar-SBV	22078298
4	1003009	Geeta Colony, Block 13-GBSSS	22548602
5	1003025	Chander Nagar-SKV	22520148
6	1003027	Gandhi Nagar, No.1-SKV	22512423
17	1003034	Gandhi Nagar, No.2-GGSSS	22416938
18	1003035	Gandhi Nagar, No.3-GGSSS	22416546
19	1003261	Gandhi Nagar-RPVV	22043771
20	1104018	Yamuna Vihar, Block C, No.1-SKV	22913585
21	1104020	Gokalpuri-SKV	22171019
22	1104023	Yamuna Vihar, Block B, No.1-GGSSS	22916329
23	1104149	Yamuna Vihar, Block B-RPVV	22917610
24	1105002	Gautam Puri-SBV	22172513
25	1105004	New Seelampur, No.1-SBV	22864267
26	1105007	Babarpur-GBSSS	22822911
27	1105008	Jafrabad-GBSSS	22566245
28	1105023	Gautam Puri-GGSSS	22188246
29	1105108	Welcome Colony-GGSS	
30	1106003	Nand Nagri, Block E-SBV	22583599
31	1106004	Nand Nagri, Janta Flats-GBSSS	22590389
32	1106007	Shahdara, Mansarovar Park, No.2-GBSSS	22588428
33	1106012	Dilshad Garden, Block J&K-GBSSS	22123061
34	1106014	Nand Nagri Extn., Block F1-F2-GBMS	22123682
35	1106020	Shahdara, Mansarovar Park, No.1-SKV	22123865
36	1106021	Seemapuri-SKV (Vishwamitra)	22353653
37	1106022	Nand Nagri, Block B-SKV (Raja Ravi Verma)	22582985

38	1106023	Dilshad Garden, Block J&K-SKV (St. Eknath)	22118830
39	1106115	Nand Nagri, Janta Flats-GGSSS	22574030
40	1106117	Saboli-GGSS	22343159
41	1106121	Dilshad Garden, Block J&K-G(Co-ed)MS	22130153
42	1106252	Nand Nagri, Block D-RPVV	22122288
43	1207004	Nehru Vihar-G(CO-ED) SSS	23819950
44	1207008	Shankaracharya Marg-SV	23972122
45	1207009	Burari-SBV	27613902
46	1207011	Shakti Nagar, No.3-SV	23849050
47	1207014	Gokhle Marg-SBV	23915568
48	1207022	Mori Gate, No.1-GBSSS	23954183
49	1207032	Lancer Road-SV	23811520
50	1207037	Shakti Nagar, No.1-SKV	23845922
51	1207111	Nathupura-GGSS	27614837
52	1208002	Qutab Road-SBV	23524985
53	1208004	Sarai Rohilla-GBSSS	23655770
54	1208006	Padam Nagar-GBSSS	23699946
55	1208008	Partap Nagar-GBSS	23692810
56	1208017	Diwan Hall-SKV(middle)	23867965
57	1208021	Tulsi Nagar-GGSSS	23649965
58	1208023	Kinari Bazar, Gali Barf Wali-GGSSS	23263257
59	1208092	Kishan Ganj-RPVV	23695836
60	1309003	Dr.Mukharjee Nagar-SV	27659017
61	1309004	New Police Lines-SV	27456916
62	1309011	Model Town, No.2-GBSSS	27113430
63	1309025	Dhakka-SKV	27455147
64	1309124	Shalimar Bagh, Block BT-RPVV	27483136
65	1309130	Azadpur Village-GBSS	27128333
66	1310002	Prahalad Pur-SBV	27823354
67	1310004	Sannoth-SV	27280344
68	1310008	Pooth Khurd-GBSSS	27753191
69	1310010	Katewara-GBSSS	27741028
70	1310013	Jahangirpuri, Block D-GBSSS	27638625
71	1310019	Bawana-GBSSS	27754539
72	1310021	Jahangirpuri, Block K-GBSSS	27637208
73	1310022	Bhorgarh-G(Co-ed)SS	27786349
74	1310028	Jahangirpuri, Block J-G(Co-ed)MS	27637425
75	1310029	Jahangirpuri, Block E-GBMS	27637953
76	1310031	Alipur-SKV	27201934
77	1310035	Jahangirpuri, Block D-SKV (Rani Chennama)	27635501
78	1310041	Khera Khurd-SKV	27874144

	1310049	Bankner-GGSSS	27280376
	1310159	Qadipur-GGSS	27731089
	1310164	Narela, Pocket 5 & 6-GGSS	27785162
	1310166	Narela-GBSSS (Mussadi Lal)	27783505
	1310168	Bankner-SBV	27780236
	1310169	Holambi Kalan,Block B-G(Co-ed)SS	
	1411003	Ashok Vihar, Phase I, Block H-SBV	27416585
	1411015	Ashok Vihar, Phase II-GBSSS	27144668
	1411016	Rani Bagh-GBSSS	
	1411019	Bharat Nagar-GBSSS	27444928
	1411030	Shakurpur, No.2-SKV	27101348
0	1411035	Wazirpur Village-SV	27215661
1	1411038	Anandwas-GGSSS	27156558
2	1412002	Mangolpuri, Block K-SBV	27923469
3	1412009	Mangolpuri, Block U-GBSSS	27918931
4	1412019	Sultanpuri, Block P-G(Co-ed)SS	25489691
5	1412082	Mangolpuri, Block J-SV(Co-ed)	27921533
6	1412085	Sultanpuri, Block D-GBSS	25470548
7	1412090	Mangolpuri, Block P-GBMS	27922299
8	1413009	Nizam Pur-G(Co-Ed)SS	25953634
9	1413013	Rithala-GBSSS	27052432
100	1413022	Ladpur-GBMS	
101	1413028	Qutabgarh-SKV	27741029
102	1413071	Rohini, Sector 15-G(Co-ed)SS	
103	1413076	Rohini, Sector 11-RPVV	27047102
104	1413079	Karala-GBSSS	25950398
105	1514003	Khyala, J.J. Colony, No.1-GBSSS	25434185
106	1514008	Janakpuri, Block B, No.2-SBV (Shaheed Capt. Anuj Nayyar)	25502379
107	1514019	Janakpuri, Block B SKV	25554137
108	1514023	Hari Nagar, Block BE-RPVV	25122670
109	1515006	Rajouri Garden Extn.-GBSSS	25193279
110	1515024	Madipur, No.2-SKV	25215980
111	1515026	Tagore Garden, No.1-GGSSS	25926723
112	1515139	Tagore Garden-GBSSS	25194072
113	1516003	Mansarovar Garden-SV	25428776
114	1516008	Ranjit Nagar-GBSSS	25705243
115	1516010	Moti Nagar GBSSS	25100165
116	1516013	Prem Nagar-GBSS	25875525
117	1516022	Shadi Khampur-SKV	25703177
118	1516027	Ramesh Nagar-SKV	25934704
119	1516068	Karampura, Industrial Area-G(Co-ed)SS	25455229

120	1516143	West Patel Nagar-SBV	25881358
121	1617001	Tikri Kalan-GBSSS	28351070
122	1617006	Hiran Kudna-SV(Co-ed)	28351506
123	1617008	Paschim Vihar, B 4-SV(Co-ed)	25252203
124	1617009	Paschim Vihar, A 6-RPVV	25275905
125	1617015	Amalwas, Jawalapuri-GBSSS	25255613
126	1618001	Matiala-SBV	25333985
127	1618002	Vikas Puri,Block A-SBV	25611463
128	1618016	Vikas Puri, Block- F-G(Co-ed)SS	28531423
129	1618017	Janakpuri, Block C-SKV	25520567
130	1618021	Uttam Nagar, No.2-GGSSS	25647061
131	1618072	Mohan Garden-GBSSS	25359320
132	1719022	R.K. Puram, Sector 7, No.3-SV	26101775
133	1719070	R.K.Puram, Sector-6, Govt. S.(Co-ed) SSS	26196965
134	1719101	Laxmi Bai Nagar(Co-Ed)-SSS	24673960
135	1719102	Netaji Nagar(Co-Ed)-SV	24671266
136	1720015	Naraina, J.J. Camp-SKV	25831887
137	1720022	Naraina-SKV	25776540
138	1720023	Naraina, J.J. Camp-GBSS	25835764
139	1720026	Vasant Kunj, B1-G(Co-ed)SSS	26122308
140	1720029	Mahipal Pur-GBSSS	26783199
141	1720031	Vasant Kunj, B1-RPVV	26122308
142	1821003	Palam Village, Raj Nagar Extn., Part 2-GBSSS	25364157
143	1821027	Palam Village, Raj Nagar, Part 1-SKV	25363749
144	1821136	Mahavir Enclave-G(Co-ed)SS	25032916
145	1821137	Dwarka-RPVV	25086911
146	1822009	Najafgarh, No.2-GBSSS	
147	1822010	Ghumanhera-GBSSS	28013044
148	1822014	Dhansa-GBSSS	
149	1822025	Jhatikara-G(Co-ed)SSS	
150	1822060	Najafgarh, No.3-GGSSS	20910389
151	1822064	Khaira-GBSSS	28015815
152	1923003	Jonapur-SV (Baba Neem Karoli)	26658104
153	1923014	Fatehpur Beri-GBSSS	26654815
154	1923015	Mehrauli, No.2-GBSSS	26646788
155	1923018	Deoli-GBSSS	26098091
156	1923021	Hauz Rani-GBSS	26683643
157	1923023	Dera-G(Co-ed)SS	26652214
158	1923031	Neb Sarai-G(Co-ed)SS	29533530
159	1923044	Dr. Ambedkar Nagar, Sector IV, No.1-GGSSS	26058690
160	1923058	Pushp Vihar, M.B.Road-GBSSS	29564232

61	1923059	Fatehpur Beri-SKV (Priya Darshani)	26653784
62	1923062	Khanpur-SKV (Hakikat Rai)	26085681
3	1923066	Dr. Ambedkar Nagar, Sector V, No.3-GBSS	26346715
64	1923068	Saket, Block G-GBSS	26568666
5	1923069	Khanpur, No.2-GBSS	
6	1923081	Chattapur-SV (Acharya Tulsi Trust)	26804615
7	1924001	Sriniwaspuri-SBV (Govind Ballabh Pant)	26911942
8	1924004	Jangpura-GBSSS	24314713
9	1924010	Andrews Ganj-GBSSS	26268044
0	1924023	Defence Colony, Block C-SKV	24331083
1	1924024	Kidwai Nagar, No.1-SKV (Rani Durgawati)	24634434
2	1924037	Jungpura-SKV (Kamla Nehru)	24317605
3	1924038	Lodhi Road, Tyagraj Nagar-RPVV	24658750
74	1925002	Noor Nagar-SBV	26911420
75	1925006	Madanpur Khadar-SBV (Rama Krishna)	26956429
76	1925011	Kalkaji, No.2-GBSSS	26431430
77	1925016	Kalkaji, DDA Flats, Phase II-GBSSS	26022433
78	1925020	Tuglakabad Extn., No.2-GBSS	
79	1925024	Kalkaji, DDA Flats, Phase II-GBSS	26027204
80	1925041	Kalkaji, DDA Flats, Phase II-GGSSS	26020571
81	1925045	Kalkaji, DDA Flats, Phase II-GGSS	26024068
182	1925049	Joga Bai-GGSSS	26983609
183	1925051	Badarpur, No.2-GBSSS	26952491
184	1925052	Joga Bai-GBSSS	26983212
185	1925058	Tughlakabad, Railway Colony, No.2-GBSS	26363896
186	1925334	Lajpat Nagar-RPVV	29810141
187	2026001	President Estate-SV (Dr.Rajinder Prasad)	23013529
188	2127001	Rouse Avenue-SBV	23235263
189	2127003	Darya Ganj, Pataudi House-SBV	23242028
190	2127006	Jama Masjid, No.2-GBSSS	23274365
191	2127007	Bela Road-GBSS	23289053
192	2127021	Bulbuli Khana-SKV	23267312
193	2127030	Bulbuli Khana(Urdu Medium)-GGMS	
194	2127032	Ajmeri Gate, Gali Bansi Koyle Wali(Urdu Medium)-GBMS	23210703
195	2128001	Paharganj-SBV	23580770
196	2128008	Rani Jhansi Road-SBV	23516709
197	2128014	Karol Bagh, Ramjas Lane, No.1-GBMS	25743514
198	2128019	Old Rajinder Nagar-SKV (Swami Daya Nand)	25784108
199	2128028	Dev Nagar, 22-B-GGMS	
200	2128031	Karol Bagh, Link Road, Plot No.1-RPVV	23622367

ANNEXURE – 2

CAL Training of Trainers August 16 -18, 2005, CAL Lab Timarpur

Timing	Day 1	Day 2	Day 3
12: 30 - 2:30 p.m.	**Grounding** • How do you feel? • What are your expectations from this training? **Overview** – Discuss their role as trainers, logistics etc **Role of Facilitator/ Recorder/ Team member** **SGA.** `Describe the student competencies in your subject in Std 6 (incoming students) (Subject Groups) **Research Study:** Competencies of Class 6 Students **Why CAL.** Participants list What is CAL & Why CAL? **Preparation of Module** Participants detail what they did, purpose, timing, who, materials reqd on Mgmt Cycle Developed on Laptop	**Training Needs of Teachers: LGA on flip-charts** **Categorize** **SGA:** Modules to address needs Problem, Solution, Reaching each participant, Materials Needed 1. Computer-related (Refresher) 2. Software-related 3. Classroom Management 4. Curriculum related 5.Administrative • Timetable • Log of Observations • Network Meeting	**Teaching (1-4)** in Cooperative Lrng mod **Putting together the Teacher Training Design**
3:00 4:30 p.m.	**Goals of UEEM –** What does each goal mean? SGA **Which goals are addressed by CAL?** LGA **Preparation of Module:** Participants detail what they did, purpose, timing, who, materials reqd	**Interactive Session: Principles of Adult Learning** **SGA:** Expert groups Practice of modules for presentation	**Interactive Session Training Skills** Group Processes Tips for Presentation Troubleshooting/ Handling difficult situations
4:30 6:00 p.m	**Input:** • Design of CAL Lab [Copy of Govt Order] **What are teachers concerns? AA** SGA (simulation) Categorization of Concerns: **Training Needs of Teachers**	**Development of Diagnostic Test**	**Closing/Valedictory**

Module Design

Objective:

Task/ Activity/ methodology	Duration	Content	Material Required	Notes

ANNEXURE – 3

Module Design Day 1

Objective: To make the participants understand the importance and relevance of CAL

- Visit room one day before training
- Ensure lights, fans, TV, computer are in working order
- Reach Centre one hour early
- Arrange Room in Circle

Task/ Activity/ methodology	**Duration**	**Content**	**Material Required**	**Notes**
- Grounding	- 40 mins	- Introduction - How are you feeling? - What are your expectations? Give reasons for activity: Questions deal with heart and head		One person leads proc One person models a Look at each person wh speaking This process establish norm for the rest of the training.
- Overview of Training Programme	- 10 mins	-Objective of Training - Agenda	Agenda on CD and on Chart	
Competency Level of Class VI Students (poorva gyan ka star)		• Formation of Groups in Subject specific Groups • Explain roles of Facilitator, Recorder, Team Member • Give the task: What are the Competency Level of Class VI Students • Group-discussion & recording • Groups read aloud • Pull discussion together, lead into next session • Class VI Research • Data available	A-4 sheets Research Presentation	Give clear directions: discussion, taking tur give points, write poin A 4 sheet ,ask groups assign roles of facilita and recorder. Walk ar the tables to see if the has been clearly understood. This bein first activity the group take a little time to get discussions
What is CAL? Why CAL?	30 min + 20 min	• Small Group Activity (SGA): Reorganize Groups by counting 1 to 6 • Task: What do you understand by CAL?? • Group Discussion and writing on A-4 sheet • Groups read aloud • Summarize, lead into next session • CAL PowerPoint Presentation	A-4 Sheets CAL presentation	Hold major questions to addressed through othe modules in the training
Goals of UEE		Make Presentation Interactively Out of the goals of UEE what goals does CAL address: Discussion	UEE Presentation	Make the participants understand the bigger picture and how they are playing an important role in
Introduction : Sharing of Curriculum - English	10 minutes	Topics included in the software subject-wise Adjustments in Time-Tables	List of Topics Handouts Timetable Information	

mplementation & use f software	10 minutes	Implementation methodology 1. How to use it in Classroom 2. Navigation structures Model Lesson with highlighting all types of questions session	Content CD	
ands on experience	30 minutes	Familiarity with content and method of delivery	Content CD & Computer Lab	
eedback sessions	10 minutes	Feedbacks	A4 sheets	Feedback from teachers on what more they need to know and what they need help with

Module Design Day 2

jective: To understand the role of a teacher in a CAL lab and introduction to subject implementation methodology

ask/ Activity/ ethodology	Duration	Content	Material Required	Notes
ow to operate Computer	1 hr. (1/2 hr. Theory & ½ hr. Practical)	Intro to computers (Start, shutdown, basic I/O devices, How to insert & open CD)	Computer LAB & 2 Faculties must.	Trouble Shooting + User Guide
To find the general perception from teacher participant about the Role of a teacher in a CAL Lab	5 minutes 15 minutes 15 minutes 5 minutes	1. Make Groups. 2. Topic discussion. 3. Representation of views by each group 4. Output/conclusions (which are surfacing out)	A-4 Sheets	Facilitate the teachers to participate in the discussion heartily.
Introduction : Sharing of Curriculum subject 3 & 4	10 minutes	Topics included in the software subject-wise Adjustments in Time-Tables	List of Topics Handouts Timetable Information	
Implementation & use of software	10 minutes	Implementation methodology 1. How to use it in Classroom 2. Navigation structures Model Lesson with highlighting all types of questions session	Content CD	
Hands on experience	30 minutes	Familiarity with content and method of delivery	Content CD and Computer Lab	
Feedback sessions	10 minutes	Feedbacks	A4 sheets	Feedback from teachers on what more they need to know and what they need help with

Module Design Day 2

Objective: To understand the role of a teacher in a CAL lab and introduction to subject implementation methodology

Task/ Activity/ methodology	**Duration**	**Content**	**Material Required**	**Notes**
Basic operations in computer	1 hr. 10 mins + 20 mins (theory) + 30 mins (Prac.)	Trouble shooting How to create a folder and copy, paste data in the folder How to use the CD & various options like select click etc		Provide them notes (Photostat copies would be ideal!)
How will you perform your duties in CAL Lab and kinds of problems faced during the operation	5 minutes 20 minutes 10 minutes 5 minutes	1. Classroom arrangement 2. One teacher behaves as CAL teacher and others behave as learners 3. Entertainment of the curiosity of the learners 4. Conclusion	Computer System & CD and A4 Sheetsa	It will be pseudo CAL Lab Exercise amongst the teachers
Introduction : Sharing of Curriculum subject 4 & 5	10 minutes	Topics included in the software subject-wise Adjustments in Time-Tables	List of Topics Handouts Timetable Information	
Implementation & use of software	10 minutes	Implementation methodology 1. How to use it in Classroom 2. Navigation structures Model Lesson with highlighting all types of questions session	Content CD	
Hands on experience	30 minutes	Familiarity with content and method of delivery	Content CD and Computer Lab	
Feedback sessions	10 minutes	Feedbacks	A4 sheets	Feedback from teachers on what more they need to know and what they need help with
Information giving on diagnostic test and monthly network meeting	15 mins	Inform the teachers about the purpose of the diagnostic test and how and when it needs to be conducted. Distribute the diagnostic test and the answer key Inform teachers about the monthly network meetings and what those meetings will be about.	Diagnostic test papers and answer key	

ANNEXURE – 4

Computer Aided Learning
Training of Teachers
Date: 29th, 30th, 31st August/ 1st, 2nd, 3rd Sept.
Time: 8.30 am 1.30 pm

Training Design

	Day 1	Day 2	Day 3
Session 1	Grounding Overview	Computer Skills	Computer Skills
Session 2	Activity : competency level of Class VI students	Activity: role of a teacher in CAL Lab	Simulation of CAL classroom to understand the role of a teacher
Session 3	What and Why of CAL	Introduction to subject implementation methodology- Subject 2	Introduction to subject implementation methodology- Subject 4
Session 4	Introduction to subject implementation methodology - English	Introduction to subject implementation methodology- Subject 3	Introduction to subject implementation methodology - Subject 5 Diagnostic test, monthly meeting of teachers

Grounding

Grounding is an important activity to start any meeting with. We all come to meetings with some measure of apprehension or uncertainty about what will happen. Grounding allows this apprehension to be stated.

This activity introduces the circle, equality and the notion of listening with respect to each other.

The participants are asked to sit in one large circle, introduce themselves and respond to two questions:

- How do you feel?
- What are your expectations from this workshop?

This is a simple grounding task that does the following:

- Establishes a model for listening with respect, speaking in turn, not interrupting and knowing that each person will be heard
- Establishes a verbal territory for each participant
- Requires access to both the left brain (thinking) and the right brain (feeling)
- Allows fears and hopes for the meeting to be expressed.
- Allows participants to express personal needs like leaving early, sickness, problems getting to work place etc
- Brings people into the "here and now"
- Provides initial information to the facilitator

The activity introduces the "Circle" where each member is being listened to with respect and interest. The speaker establishes a verbal territory at the outset, apprehensions and awkwardness fade away as they find themselves being listened to in a silence. This experience brings everyone into the "here and now" and helps them feel confident about expressing their thoughts and feelings through the rest of the day.

Role of Teacher in Computer Aided learning room

Shift from `a sage on the stage' to `a guide from the side.'

New role of teachers in new classroom requires a fresh attitude, new classroom atmosphere and lots of motivati
At the outset the teacher has to explain to the HoS about objectives of CAL lab and what kind of classr
management will be required and that the project is consistent with the curriculum.

In the first week the teacher has to help the children not feel threatened by the new technology tell them that
fast and effective medium of learning. The teacher has to ensure that every child gets equal proficiency and co
on the computer. Help the students taste success first.

While the teachers don't have to decide how to teach a topic, as computer program decides that, s/he h
organize, monitor and regulate student activities in the classroom. Teacher needs to direct students to sp
learning outcome. S/he has to assess where each student is in terms of knowledge of topic and decide how
needs to be taught and at what level. Teacher has to continuously monitor understanding of learner and explain
gaps and manage movement to next difficulty level.

Teacher must be proficient in running the CAL program and ensure that the whole concept plays without interru
once and then decide whether to stop and explain; replay or go previous topic or move to the next topic.

A simple way of explaining the new role of a teacher in this setting is to think of a cyclist learning to ride a motor
The only thing that has changed is the fitting of an enegine. The rider still has to make all decisions about wher
is headed, when to stop, when to turn and also to maintain a balance at all times.

Teacher needs

- To motivate learners to use computers as a learning medium
- To facilitate every learner to operate CAL program on the computer
- To arrest the attention of all learners all the time during CAL program
- To note down deficiencies and uneasiness during CAL program
- To maintain time and adjustment for CAL with the main teaching
- To allow learners to access teaching learning material to allow them to touch the software system safely
- To address discipline problems due to large number of students (group work or division of large class into 2
- To ensure that children are working out problems and writing.
- To be able to control the classroom in adverse situations like: failure of system, electricity, disturbance students etc

The teacher's role changes in a CAL classroom.

The shift is from a role of `a sage on the stage' to `a guide from the side.'

The teacher is no longer the center of attention as the dispenser of information, but rather plays the role of facilitator, moving from student to student or group to group, providing suggestions and support for student activity.

As students watch the technology-supported products, the teacher can watch for the complete involvement of all students, checks whether all students have understood a concept before moving on to the next topic and sets interesting class work and homework to consolidate the students learnings.

Most importantly, the teacher actively explores and learns with the students

GUIDELINES FOR PRINCIPALS/MASTER TRAINER FOR USE OF CAL CLASSROOM

In order to develop various skills among students of class VI in various subjects, Project 'CAL' has been introduced in 200 Govt-Schools as part of a Pilot Project. It is expected that HoS/Master Trainers would make maximum use of these labs and would personally see that the Classroom is functional for all the 48 periods per week. The following guidelines would help then in resetting the time table for class VI after allocating the periods for CAL. As the no. of sections in our schools in class VI are varying from 1 to 26, the following 5 types of time table for CAL Classroom have been prepared. Schools are advised to choose the one which fulfill their requirement.

FORM OF CAL TIME TABLE	NO. OF SECTIONS
1	4
2	8
3	12
4	16
5	Above 16

1. The concepts involved in various subjects are based on the previous knowledge of students of Class I to V and not from the syllabus of Class VI.

2. Two periods in continuation are to be allotted to a subject for CAL Classroom

3. HoS are advised to readjust the Monday test in any other period for those students who are going to CAL Classroom in Ist period on Monday.

4. In Class VI leave arrangement period can be assigned to physical education during the period when CAL is in process.

5. Subjects which are to be taught through CAL are MATHS, ENGLISH, SCIENCE, SOCIAL SCIENCE, and HINDI. As the subjects cannot be introduced simultaneously because of the constraints of Classroom, no. of sections and availability of Master Trainer, it was decided to introduce the subjects in the above order. However schools having less no of section can start with more subjects.

6. The master trainer in respective subject is expected to train at least one more member of the same faculty whenever possible, as it would help in smooth functioning of the Classroom whenever the teacher is on leave.

7. In order to create more interest and motivate the children the teacher must develop skills in children to operate the system.

8. Students of classes V, VII can also be taught through CAL if the resources and time permits.

9. Schools having no. of sections up to 4 in Class VI are to follow Type I of Time Table. Allocation of periods to various subjects is mentioned in the Time Table. Each section would study through CAL for two periods daily. Schools are advised to start one subject in one section in order to maintain the continuation in a subject and give a break to Master Trainer and after completion of that subject. A particular section can switch over to next and hence cover all the subjects. Expected time to complete one subject is 2 weeks with an extension of one week only. This way these schools would able to cover all the subjects within 15 weeks (maximum). The schools having no. of sections less than 4 (i, e. 1, 2 3) can start more subject simultaneously with minor changes in CAL Time Table.

10. Schools having no. of sections upto 8 (i, e. 5 to 8) in Class VI are to follow type II. This time table is prepared for 8 Sections in Class VI. Each section would go to CAL Classroom thrice a week i.e. on every alternate day. Allocation of periods to various subjects is mentioned in the time table. Schools are advised to introduce two subjects simultaneously i, e. Maths in VI A and English in VI B and so on and then can interchange after completing two subjects. They can take up another two subjects similarly. This arrangement is in view of the fact that a single subject Master trainer cannot teach for all the 8 periods in a day. Schools having no of sections 5, 6, 7 can make minor changes in type II Time Table accordingly.

11. Schools having no of sections upto 12 (i,e. 9 to12) would follow form III. Allocation of periods to various subjects is mentioned in the time table. Each section of class VI would visit the CAL Classroom twice a week. To start with two subjects should be introduced. e.g. Maths in one section and English in another and vice versa. After completion of two subjects schools should switch over to next two subjects Schools having no of section (9, 10, 11) can make minor changes in time table suitably.

12. Schools having no of sections upto 16 (i, e. 13 to 16) would follow form IV. Allocation of periods could be that of form III. 8 Sections would go to CAL Classroom twice a week and 8 sections would go once a week. The sections which are going to Classroom twice a week, two subjects should be introduced simultaneously i, e Maths in one and English in another and vice versa. Whereas sections going to CAL Classroom only once would take up Maths only. School having section 13, 14, 15 can make minor changes in the table, the less no. of sections, more visits to CAL Classroom by various sections.

13. Schools having no. of section more then 16 would follow Type V. Each section would visit the Classroom once a week for 2 periods. Maths would be taken up first on completion of this subject another subjected would be taken up.

COMPUTER RELATED INSTRUCTIONS

HOW TO START

A UPS & CPU

1. Insert the UPS plug into main power point.
2. Switch on UPS power button.
3. Check for the light in UPS & then for CPU.
4. If green light is detected in UPS then it is working fine else if red light is detected then repeat the above steps 1 3.
5. Switch on power button of CPU.

B T.V.

1. Insert the T.V. plug into main power point.
2. Switch on power button of T.V.
3. Check the light otherwise check the connection.

TROUBLE SHOOTING

4. If the screen hangs then press the combination of following keys on the keyboard together
    a. Ctrl
    b. Alt
    c. Delete
5. If message box appears on the screen then click on End Task button on message box with the help of mouse.
6. If same message box appears again then repeat above step (2) else if different message box appears then click on End Now button on message box with the help of mouse.
7. In case system still hangs then press the restart button on CPU.
8. Wait Until the screen appears.

ANNEXURE – 5

Time Table I

CAL LAB Time Table

Class VI | **Max. No. of Sections –4**

	I	II	III	IV		V	VI	VII	VIII
Monday	VI A (Math)		VI B (English)		RECESS	VI C (Science)		VI D (Social Science)	
Tuesday	VI A		VI B			VI C		VI D	
Wednesday	VI A		VI B			VI C		VI D	
Thursday	VI A		VI B			VI C		VI D	
Friday	VI A		VI B			VI C		VI D	
Saturday	VI A		VI B			VI C		VI D	

Time Table I

CAL LAB Time Table

Class VI | **Max. No. of Sections –4**

Allocation of Periods to Class VI

Cal LAB	12
Language I	6
Language II	6
Language III	4
Maths	6
Science & Technology	6
Social Science	6
H.Sc./Dr/Music	2
Total	48

Expected Time for CAL Subject wise

Mathematics	3 weeks
English	3 weeks
Science & Technology	3 weeks
Social Science	3 weeks
Hindi	3 weeks

No. of Schools – 59+

Time Table II

CAL LAB Time Table

Class VI **Max. No. of Sections –8**

Allocation of Periods to Class VI	
Cal LAB	6
Language I	7
Language II	6
Language III	4
Maths	7
Science & Technology	7
Social Science	7
H.Sc./Dr/Music	2
Physical Education	1
Library	1
Total	**48**

Expected Time for CAL Subject wise	
Mathematics	5 weeks
English	5 weeks
Science	4 weeks
Social Science	4 weeks

No. of Schools – 53+

Time Table II

CAL LAB Time Table

Class VI **Max. No. of Sections –8**

	I	II	III	IV		V	VI	VII	VIII
Monday	VI A (Math)		VI C (Eng.)			VI E (Math)		VI G (Eng.)	
Tuesday	VI B		VI D		RECESS	VI F		VI H	
Wednesday	VI A		VI C			VI E		VI G	
Thursday	VI B		VI D			VI F		VI H	
Friday	VI A		VI C			VI E		VI G	
Saturday	VI B		VI D			VI F		VI H	
	1,3,5 VI A		1,3,5 VI C			1,3,5 VI E		1,3,5 VI G	
	2,4,6 VI B		2,4,6 VI D			2,4,6 VI F		2,4,6 VI H	

Time Table III

CAL LAB Time Table

Class VI **Max. No. of Sections –12**

	I	II	III	IV		V	VI	VII	VIII
Monday	VI A (Math)		VI D (Eng.)			VI G (Math)		VI J (Eng.)	
Tuesday	VI B		VI E		RECESS	VI H		VI K	
Wednesday	VI C		VI F			VI I		VI L	
Thursday	VI A		VI D			VI G		VI J	
Friday	VI B		VI E			VI H		VI K	
Saturday	VI C		VI F			VI I		VI L	
	1,4 VI A		1,4 VI D			1,4 VI G		1,4 VI J	
	2,5 VI B		2,5 VI E			2,5 VI H		2,5 VI K	
	3,6 VI C		3,6 VI F			3,6 VI I		3,6 VI L	

Time Table III

CAL LAB Time Table

Class VI **Max. No. of Sections –12**

Allocation of Periods to Class VI

Cal LAB	4
Language I	7
Language II	6
Language III	4
Maths	7
Science & Technology	7
Social Science	7
H.Sc./Dr/Music	2
Phy. Education/Yoga	1
Computer Education	2
Library	1
Total	48

Expected Time for CAL Subject wise

Mathematics	7 weeks
English	7 weeks

No. of Schools – 29+

Time Table IV

CAL LAB Time Table

Class VI

Max. No. of Sections –16

Note: 8 sections will go for 2 days. 8 sections will go for 1 day.

	I	II	III	IV		V	VI	VII	VIII
Monday	VI A		VI D		RECESS	VI G		VI K	
Tuesday	VI B		VI E			VI H		VI L	
Wednesday	VI A		VI D			VI G		VI M	
Thursday	VI C		VI F			VI I		VI N	
Friday	VI B		VI E			VI G		VI O	
Saturday	VI C		VI F			VI J		VI P	
	1,4 VI A		1,4 VI D			1,3 VI G		1 VI K	
	2,5 VI B		2,5 VI E			2,5 VI H		2 VI L	
	3,6 VI C		3,6 VI F			4 VI I		3 VI M	
						6 VI J		4 VI N	
								5 VI O	
								6 VI P	

Time Table IV

CAL LAB Time Table

Class VI

Max. No. of Sections –16

Allocation of Periods to Class VI

Cal LAB	4
Language I	7
Language II	6
Language III	4
Maths	7
Science & Technology	7
Social Science	7
H.Sc./Dr/Music	2
Phy. Education/Yoga	1
Computer Education	2
Library	1
Total	48

Expected Time for CAL Subject wise

Mathematics	7 weeks for sections having 4 periods in CAL Lab
English	7 weeks for sections having 4 periods in CAL Lab
Mathematics	14 weeks for sections having 2 periods in CAL Lab

No. of Schools – 17+

Time Table V

CAL LAB Time Table

Class VI **Max. No. of Sections – More than 16**

Note: Each Section will go to Cal Lab for 2 periods per week

Allocation of Periods to Class VI	
Cal LAB	2
Language I	7
Language II	6
Language III	4
Maths	7
Science & Technology	7
Social Science	7
H.Sc./Dr/Music	3
Phy. Education/Yoga	2
SUPW/Comp. Edu.	2
Library	1
Total	48

Expected Time for CAL Only Maths	
Mathematics	14 Weeks

No. of Schools – 6+

ANNEXURE – 6

DIRECTORATE OF EDUCATION
OLD SECRETARIAT, DELHI-110054

No.F. Dated:

ORDER

Directorate of Education has started Computer Aided Learning Programme in 200 Delhi Government Schools. All the District DDEs/EOs/DEOs are hereby directed to visit the Government Schools of their respective District, as per annexure where Computer Aided Learning (CAL) Labs have been established. All the Principals of these schools were already directed to implement CAL Classes for Class-VI students, and the Time Table for Class-VI was also supplied to the Principals of these schools during the Principals' Meeting held at Sarvodaya Vidyalaya, Lancers Road, Timarpur. All the District DDEs are to ensure the following while visiting the schools as per the schedule enclosed.

- Inspecting Officers should sit through at least one class.
- An inspection proforma is being enclosed herewith. While inspecting the CAL School, the same may be filled in.
- After inspecting the CAL school, the concerned DDE/EO/DEO should submit the inspection report to the undersigned.

Non compliance of the above order will be viewed seriously.

(GITANJALI G. KUNDRA
ADDL. DE(ADMN.

Encls: 1. Inspection Proforma
2. List of 200 CAL Schools
Alongwith name of the Inspecting Officer.

Copy to:

1. PS to DE.
2. All the District DDEs.
3. All the concerned EOs/DEOs(through concerned DDE)
4. OS(CAL)

INSPECTION REPORT
REGARDING COMPUTER AIDED LEARNING PROGRAMME

1.	Date of visit			
2.	Name of the Inspecting Officer			
3.	School ID			
4.	School Name			
5.	Whether the following hardware has been received by the school or not?			
		Yes	No	Remarks
	29" Colour TV			
	Computer, Mouse, Keyboard			
	Wooden Box			
	40 Coloured Plastic Chairs			
6.	Whether CAL Room is painted and made ready for CAL Classes or not?			
7.	Whether Electricity Supply with proper earthing is made for CAL Room or not?			
8.	Whether all the hardware is placed in CAL Room or not?			
9.	Whether all the hardware is in working condition or not?			
10.	Whether Time Table for Class-VI has been prepared and implemented by the Principal/HOS including CAL Classes or not?			
11.	Whether CAL Classes are being taken by the respective Teachers regularly or not?			
12.	Whether all the five subject teachers of Class-VI have been trained to use CAL content or not?			
13.	**Feedback from Teachers**			
	a) Whether the students are showing interest in learning?			
	b) Whether any improvement is being noted by the teachers in the students grasping power?			
	c) Whether there is any decrease in truancy?			
	d) Whether there is any increase in attendance of Class-VI?			
	e) Whether the students are answering to the questions generated through CAL CDs?			
	f) Whether the students are given a chance to operate the games or questions given in CAL content?			
14.	Over all opinion of the Teachers regarding CAL			
15.	Principal/HoS's opinion regarding CAL			
16.	Remarks of DDE			

Signature & Name of the Inspecting Officer
Employee ID: ....

Copy to :

1. Addl. DE(Admn.), Directorate of Education,
Old Secretariat, Delhi-110054.

ANNEXURE – 7

CAL Resource Team		
Sl. No.	Name	Designation
1	Mr. Ashok Kumar	Project Manager
2	Mr. B.P.S. Kardam	Project Co-Ordinator
3	Mr. Vikas Kumar	Team Head (Technical)
4	Mrs Vijay Mohan	Team Head (IRPs)
5	Mrs. Nita Behal	IRP-Maths
6	Mr. Rajendra Kumar	IRP-Science
7	Mr. Ashwani Kumar	IRP-Science
8	Mr. N.S.Dahiya	IRP-Science
9	Mrs. Neelma Puri	IRP-Science
10	Dr. Rakesh Singh	IRP-Hindi
11	Mr. Sanjay Prakash Sharma	IRP-English
12	Mr. Sudhir Kumar Mudgal	IRP-Maths
13	Mrs. Vandana Sharma	IRP-English
14	Mr. Arbind Kumar Pandey	IRP-Social Science
15	Mr. N. Bhaskara Rao	Project Compiler
16	Mrs. Leena Jain	Voice Over Artist
17	Mr. Sunil Kumar	Designer
18	Mr. Netesh Pande	Sr. Multimedia Programmer
19	Mr. Abhishek Kumar Rai	Sr. Multimedia Programmer
20	Mr. Sanjeev Kumar	Sr. Multimedia Programmer
21	Mr. Saurabh Gogia	Sr. Multimedia Programmer
22	Mr. Syed Nadim Akhtar	Sr. Multimedia Programmer
23	Mr. Tony Nongmaithem Singh	Sr. Multimedia Programmer
24	Mr. Mahesh Kumar	Sr. Multimedia Programmer
25	Ms. Deepti	Sr. Multimedia Programmer
26	Mr. Aaquil Rahmani	Sr. Multimedia Programmer
27	Ms. Arpita Sawhney	Sr. Multimedia Programmer
28	Ms. Arshia Islam	Multimedia Programmer
29	Mr. Sachin Saini	Multimedia Programmer
30	Mr. Rajneesh Verma	Network Administrator
31	Mr. Krishna Ballabh Bhardwaj	Multimedia Programmer
32	Mr. Alok Kumar Jha	Multimedia Programmer
33	Mr. Amit Kumar	Multimedia Programmer
34	Ms. Anju Mishra	Multimedia Programmer
35	Mr. Pramod Kumar Kudari	Multimedia Programmer
36	Mr. Mantosh Kumar	Jr. Multimedia Programmer
37	Mr. Gaurav Saxena	Jr. Multimedia Programmer
38	Mr. Raviraj	Network Administrator

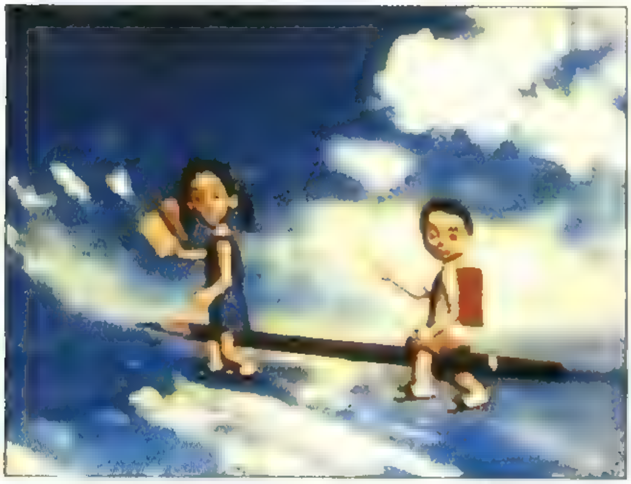
39	Ms. Priyanka	Artist-Background
40	Ms. Gurpreet Kaur	3D-Animator
41	Ms. Anjana	Artist-Background
42	Ms. Sneha Jain	Artist-Background
43	Mr. Amit Pandey	Voice Over Artist
44	Ms. Jyoti Aneja	3D-Animator
45	Mr. Ritu Raj	Artist-Background
46	Ms. Shweta Mendiratta	3D-Animator
47	Ms. Nida Fareed	Artist-Background
48	Mr.Chetan Kukreti	Artist-Background
49	Mr. Rakesh Kumar	Multimedia Programmer
50	Mr. Jitendra Prasad	2D-Animator
51	Ms. Sima Kumari	Multimedia Programmer
52	Mr. Sanjeev Kumar	Multimedia Programmer
53	Mr. Imran Asif	Multimedia Programmer
54	Mr. Rashmi Ranjan Jha	Music Composer
55	Mr. Anoop Kumar	Visualiser
56	Mr. Vishu Khanna	Layout Artist
57	Ms. Chandresh Pandey	Music Artist
58	Mr. Avijit Nath	2D-Animator
59	Mr. Deepak Sharma	2D-Animator
60	Mr. Shekhar Kashyap	3D-Animator
61	Mr. Laishram Rajiv Singh	Jr. Visualiser
62	Mr. Jagdeep Singh Sagoo	3D-Animator
63	Mr. Vijay Joshi	Artist-Background
64	Mr. Mahesh Kumar	Artist-Background
65	Mr. Ali Hilal Zaidi	3D-Animator
66	Mr. Vishal Parashar	3D-Animator
67	Mr. P. Pardip Singh	Visualiser
68	Mr. Abhilash Kumar	Multimedia Programmer
69	Mr. Roshan Kumar	Multimedia Programmer
70	Ms. Roopa Devi	Sr. Bilingual Typist
71	Ms. Satyaprakash	Sr. Bilingual Typist
72	Ms. Poonam	Sr. Bilingual Typist
73	Mr. Deepak Kumar	Bilingual Typist
74	Mr. Ashok Kumar	Bilingual Typist
75	Mr. Sanjay Kumar	Peon
76	Mr. Vijaypal Singh	Peon
77	Mr. Mohan Kumar	Canteen Operator

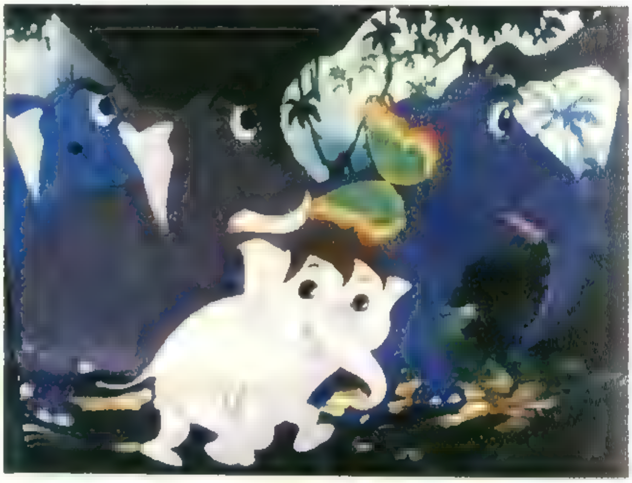
ANNEXURE – 8

The Times of India, New Delhi
Wednesday, February 8, 2006
TIMES

New chapter: Govt schools to junk blackboards for multimedia screens

All Lessons In Classes 6-10 To Be In Digital Format





By Abantika Ghosh

New Delhi: Bye bye boring blackboards. Delhi government schools are preparing to welcome multimedia screens.

Monitors where Golu and Molu ride a rocket for a tour of the solar system, a group of elephants raid a kitchen. A team of blood droplets show their composition and there is human dissection as well, albeit digital. And linear equations sing and dance their way to solutions.

Welcome to the world of CAL (computer-aided learning), Delhi government education department's ambitious project under which every lesson in NCERT textbooks for class VI to X are being converted to multimedia. The pilot phase for the class VI bridge course is already on in 200 government schools. Work is on in the digitisation of the class X syllabus, but trials are on in a handful of schools only. The pilot project for class X will start in April.

The idea, concedes project director Ashok Kumar, started from the popular animation series Pokemon. "There are a large number of characters, with complicated hierarchies and evolutions and children remember all of it by heart. Obviously animation does the trick. So, we decided to create our own cartoon characters and teach the lessons through stories featuring them." Thus, the problem of pollution is explained through the story of Gamraj and Veerbhadra who descend from heaven to earth and find the water of the Ganges too dirty to drink.

In the first stage a bridge course compiling the syllabi of classes I to V was prepared. The four-hour-long animation flick is shown to students of class VI over a period of three months, spread over two CAL classes per day. "A lot of the students who come to us from MCD schools have no idea of even alphabets, how can you teach them anything. Hence we decided to have this refresher course and the results have been very good," says Kumar.

A team of 45-odd designers and graphic artistes and 20-odd teachers from various government schools are working on the project. At a cost of about Rs 60,000 per classroom and with 20,000 classrooms to be reached, CAL, because of its immense dependence on technology, is a project that would need a lot of resources. The hardware for the bridge course pilot project, worth approximately Rs 1.5 crore, was funded by a corporate.

Kumar says: "It will take at least a couple of years more for the texts of all classes to be converted to multimedia and we are trying to do that within our own budget."

There are also plans to sell marketing rights to a company once the project is completed so that it is available to all school children. "It is a unique initiative and the idea is to make it available to as many children as possible, not just those in Delhi government schools," Kumar says. The department has already received an offer of Rs 1.5 crore, but finalisation will take a while.

Hindustan Times, New Delhi

Excitement amid wait

Lessons rendered in animation form...

ANURADHA Mukherjee
New Delhi, April 21

THE ANTICS of Rodeo and Felio, a cat and mouse pair that teaches preposition. Jhumroo and Damroo's treasure hunt that simplify math lessons. Or, the reporting exploits of an imaginary TV channel — Calnews — led by intrepid reporter Andher Chaurasia.

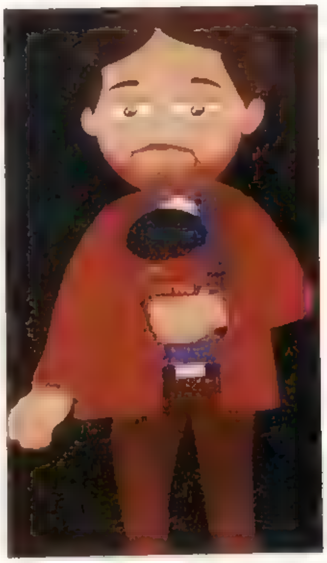
Hardly studies, but they are part of lessons presented in animation form for the 10 lakh-odd students studying in the 929 schools of the Delhi government.

Starting with the bridge course for Class VI and the Class X syllabus, eventually courses for all classes will be taught in the new format.

While the fun quotient has been kept high for lower classes with cartoons, stories, popular Hindi film songs and humour, for senior students, the effort is to explain, with a voiceover, difficult concepts through 3-D images.

Students would also be taught through animation how to draw diagrams. "All chapters are devised to look like stories, while at the same time not ignoring the course content," said Ashok Kumar, project manager, IT, education department.

So you have Jhumroo and Damroo hunting for a treasure, but, in the course of it, they go through the basics of mathematics — counting to LCM, covered in Classes I to V. All lessons have a summary in the form of a song in the end.

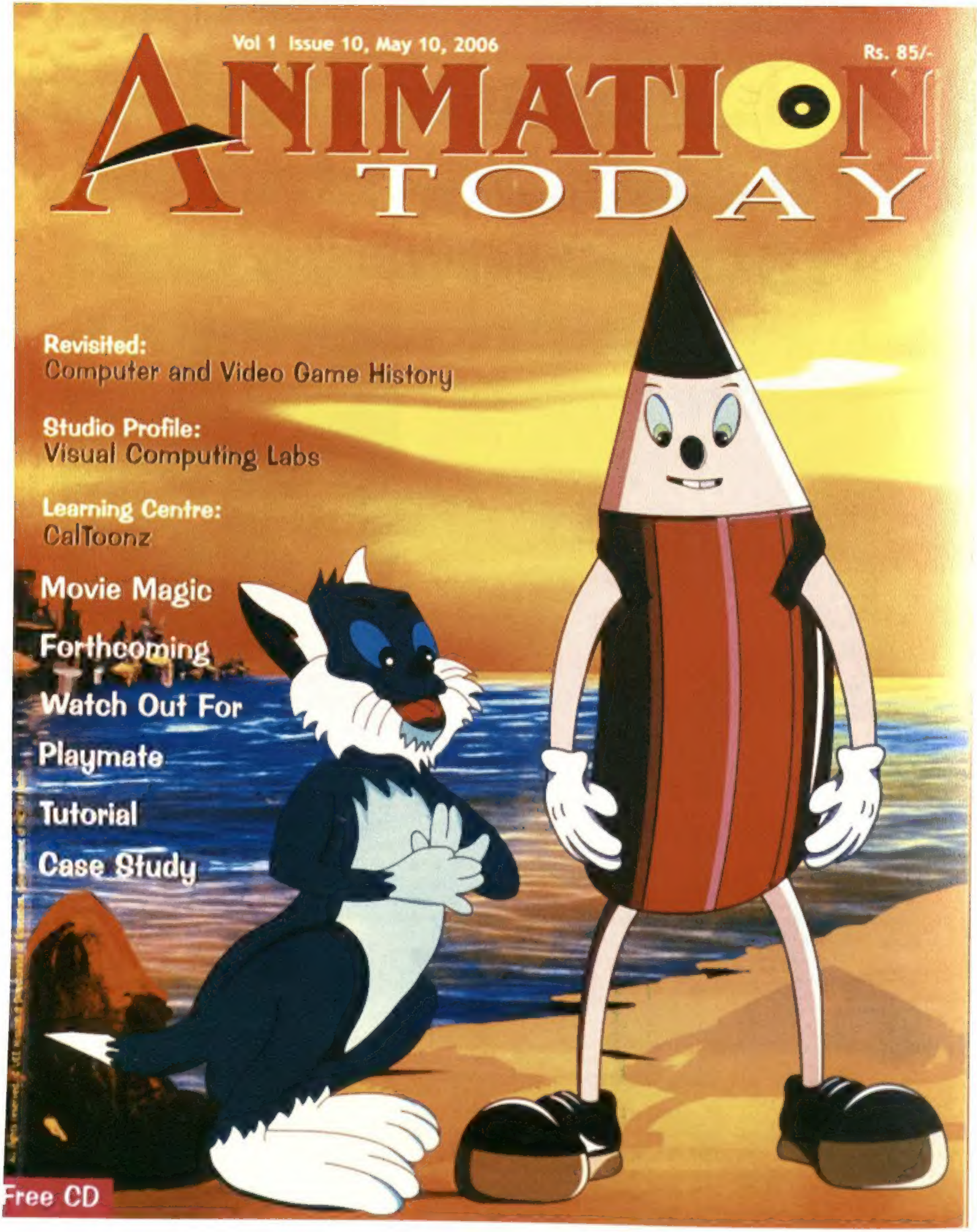


Reporter Andher Chaurasia lends fun to courses

"Even in senior classes, we have tried to keep things exciting. For the economics component of the Class X social science syllabus, a unit on the 'Challenges Facing Indian Economy' has been presented in the form of a news bulletin with popular journalists delivering the lessons," said Kumar.

Andher Chaurasia, Pagma and Sardeep Sardesai after all ring a bell somewhere for 15-year-olds.

A part of the Computer Aided Learning project — CALTOONZ — is probably inspired by the premise that a child learns best when he does not realise that he is actually learning.



Vol 1 Issue 10, May 10, 2006

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ANIMATION TODAY

Revisited:
Computer and Video Game History

Studio Profile:
Visual Computing Labs

Learning Centre:
CalToonz

Movie Magic

Forthcoming

Watch Out For

Playmate

Tutorial

Case Study

Free CD

Some photographs of CAL Class Rooms

Children excited in going to CAL Classroom

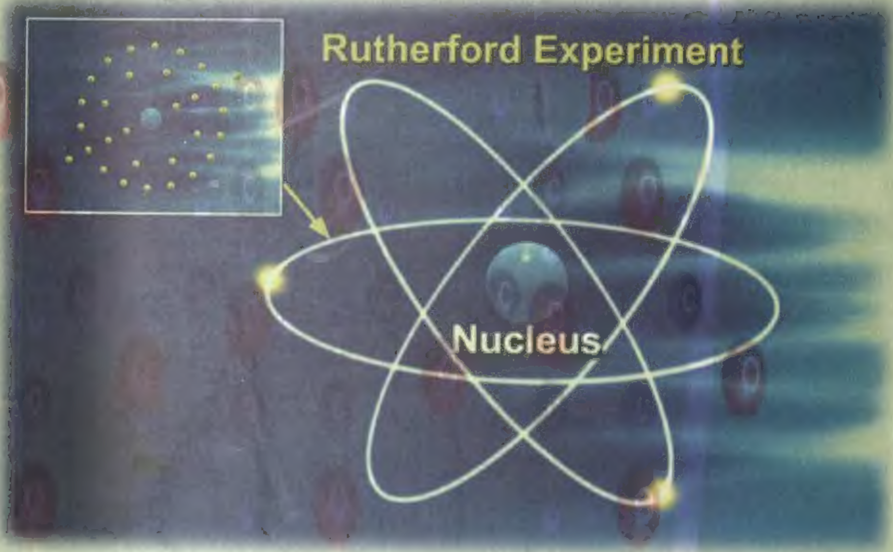
The whole class participating in the CAL class.
SKV No.1 Shakti Nagar

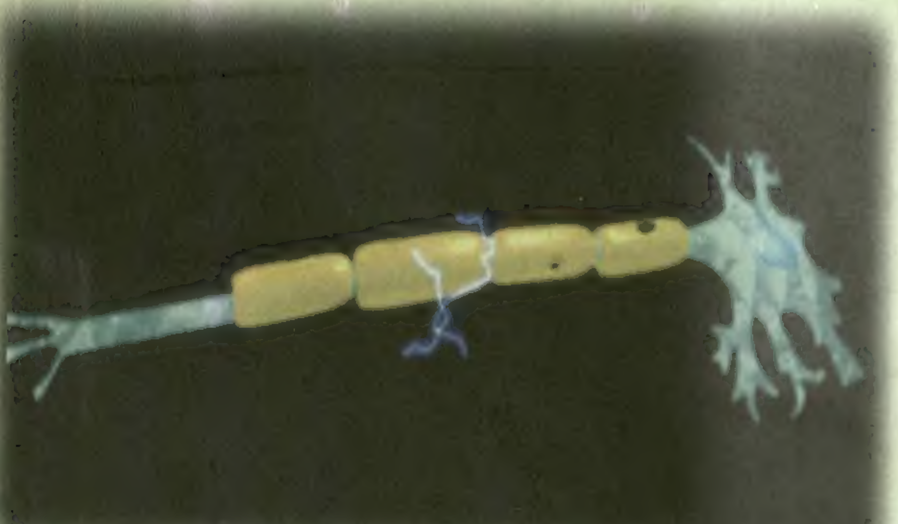
All CAL Classrooms are colourful.
SKV, C1, Yamuna Vihar

CAL toonZ 2006

YUVA
SCHOOL
COMPUTER
AIDED
LEARNING

DEPARTMENT OF EDUCATION
GOVERNMENT OF NCT OF DELHI


Rutherford Experiment
Nucleus



DELHI GOVERNMENT
TEAM DELHI-MAKING THINGS HAPPEN